DAIKIN

SiUS30 - 604

R-410A

Service Manual

VRV-WII

Water Cooled Inverter Series

— Heat Pump / Heat Recovery-60Hz —

VRV-WII Water Cooled Inverter Series

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1. Introduction

1.1 Safety Cautions

Cautions and Warnings

- Be sure to read the following safety cautions before conducting repair work.
- The caution items are classified into "⚠ **Warning**" and "⚠ **Caution**". The "⚠ **Warning**" items are especially important since they can lead to death or serious injury if they are not followed closely. The "⚠ **Caution**" items can also lead to serious accidents under some conditions if they are not followed. Therefore, be sure to observe all the safety caution items described below.
- About the pictograms

△ This symbol indicates an item for which caution must be exercised.
The pictogram shows the item to which attention must be paid.

◯ This symbol indicates a prohibited action.
The prohibited item or action is shown inside or near the symbol.

● This symbol indicates an action that must be taken, or an instruction.
The instruction is shown inside or near the symbol.

- After the repair work is complete, be sure to conduct a test operation to ensure that the equipment operates normally, and explain the cautions for operating the product to the customer.

1.1.1 Caution in Repair

⚠ Warning	
Be sure to disconnect the power cable plug from the plug socket before disassembling the equipment for a repair. Working on the equipment that is connected to a power supply can cause an electrical shock. If it is necessary to supply power to the equipment to conduct the repair or inspecting the circuits, do not touch any electrically charged sections of the equipment.	
If the refrigerant gas discharges during the repair work, do not touch the discharging refrigerant gas. The refrigerant gas can cause frostbite.	
When disconnecting the suction or discharge pipe of the compressor at the welded section, release the refrigerant gas completely at a well-ventilated place first. If there is a gas remaining inside the compressor, the refrigerant gas or refrigerating machine oil discharges when the pipe is disconnected, and it can cause injury.	
If the refrigerant gas leaks during the repair work, ventilate the area. The refrigerant gas can generate toxic gases when it contacts flames.	
The step-up capacitor supplies high-voltage electricity to the electrical components of the outside unit. Be sure to discharge the capacitor completely before conducting repair work. A charged capacitor can cause an electrical shock.	
Do not start or stop the air conditioner operation by plugging or unplugging the power cable plug. Plugging or unplugging the power cable plug to operate the equipment can cause an electrical shock or fire.	

⚠ Caution	
Do not repair the electrical components with wet hands. Working on the equipment with wet hands can cause an electrical shock.	
Do not clean the air conditioner by splashing water. Washing the unit with water can cause an electrical shock.	
Be sure to provide the grounding when repairing the equipment in a humid or wet place, to avoid electrical shocks.	
Be sure to turn off the power switch and unplug the power cable when cleaning the equipment. The internal fan rotates at a high speed, and cause injury.	
Do not tilt the unit when removing it. The water inside the unit can spill and wet the furniture and floor.	
Be sure to check that the refrigerating cycle section has cooled down sufficiently before conducting repair work. Working on the unit when the refrigerating cycle section is hot can cause burns.	
Use the welder in a well-ventilated place. Using the welder in an enclosed room can cause oxygen deficiency.	

1.1.2 Cautions Regarding Products after Repair

⚠ Warning	
Be sure to use parts listed in the service parts list of the applicable model and appropriate tools to conduct repair work. Never attempt to modify the equipment. The use of inappropriate parts or tools can cause an electrical shock, excessive heat generation or fire.	
When relocating the equipment, make sure that the new installation site has sufficient strength to withstand the weight of the equipment. If the installation site does not have sufficient strength and if the installation work is not conducted securely, the equipment can fall and cause injury.	
Be sure to install the product correctly by using the provided standard installation frame. Incorrect use of the installation frame and improper installation can cause the equipment to fall, resulting in injury.	For integral units only
Be sure to install the product securely in the installation frame mounted on a window frame. If the unit is not securely mounted, it can fall and cause injury.	For integral units only

⚠ Warning	
Be sure to use an exclusive power circuit for the equipment, and follow the technical standards related to the electrical equipment, the internal wiring regulations and the instruction manual for installation when conducting electrical work. Insufficient power circuit capacity and improper electrical work can cause an electrical shock or fire.	
Be sure to use the specified cable to connect between the indoor and outdoor units. Make the connections securely and route the cable properly so that there is no force pulling the cable at the connection terminals. Improper connections can cause excessive heat generation or fire.	
When connecting the cable between the indoor and outside units, make sure that the terminal cover does not lift off or dismount because of the cable. If the cover is not mounted properly, the terminal connection section can cause an electrical shock, excessive heat generation or fire.	
Do not damage or modify the power cable. Damaged or modified power cable can cause an electrical shock or fire. Placing heavy items on the power cable, and heating or pulling the power cable can damage the cable.	
Do not mix air or gas other than the specified refrigerant (R-410A) in the refrigerant system. If air enters the refrigerating system, an excessively high pressure results, causing equipment damage and injury.	
If the refrigerant gas leaks, be sure to locate the leak and repair it before charging the refrigerant. After charging refrigerant, make sure that there is no refrigerant leak. If the leak cannot be located and the repair work must be stopped, be sure to perform pump-down and close the service valve, to prevent the refrigerant gas from leaking into the room. The refrigerant gas itself is harmless, but it can generate toxic gases when it contacts flames, such as fan and other heaters, stoves and ranges.	
When replacing the coin battery in the remote controller, be sure to disposed of the old battery to prevent children from swallowing it. If a child swallows the coin battery, see a doctor immediately.	

⚠ Caution	
Installation of a leakage breaker is necessary in some cases depending on the conditions of the installation site, to prevent electrical shocks.	
Do not install the equipment in a place where there is a possibility of combustible gas leaks. If a combustible gas leaks and remains around the unit, it can cause a fire.	
Be sure to install the packing and seal on the installation frame properly. If the packing and seal are not installed properly, water can enter the room and wet the furniture and floor.	For integral units only

1.1.3 Inspection after Repair

⚠ Warning	
Check to make sure that the power cable plug is not dirty or loose, then insert the plug into a power outlet all the way. If the plug has dust or loose connection, it can cause an electrical shock or fire.	

⚠ Warning	
If the power cable and lead wires have scratches or deteriorated, be sure to replace them. Damaged cable and wires can cause an electrical shock, excessive heat generation or fire.	
Do not use a joined power cable or extension cable, or share the same power outlet with other electrical appliances, since it can cause an electrical shock, excessive heat generation or fire.	

⚠ Caution	
Check to see if the parts and wires are mounted and connected properly, and if the connections at the soldered or crimped terminals are secure. Improper installation and connections can cause excessive heat generation, fire or an electrical shock.	
If the installation platform or frame has corroded, replace it. Corroded installation platform or frame can cause the unit to fall, resulting in injury.	
Check the grounding, and repair it if the equipment is not properly grounded. Improper grounding can cause an electrical shock.	
Be sure to measure the insulation resistance after the repair, and make sure that the resistance is 1 Mohm or higher. Faulty insulation can cause an electrical shock.	
Be sure to check the drainage of the indoor unit after the repair. Faulty drainage can cause the water to enter the room and wet the furniture and floor.	

1.1.4 Using Icons

Icons are used to attract the attention of the reader to specific information. The meaning of each icon is described in the table below:

1.1.5 Using Icons List

Icon	Type of Information	Description
Note:	Note	A “note” provides information that is not indispensable, but may nevertheless be valuable to the reader, such as tips and tricks.
Caution	Caution	A “caution” is used when there is danger that the reader, through incorrect manipulation, may damage equipment, loose data, get an unexpected result or has to restart (part of) a procedure.
Warning	Warning	A “warning” is used when there is danger of personal injury.
	Reference	A “reference” guides the reader to other places in this binder or in this manual, where he/she will find additional information on a specific topic.

1.2 PREFACE

Thank you for your continued patronage of Daikin products.

This is the new service manual for Daikin's water cooled VRV System.
Daikin offers a wide range of models to respond to building and office air conditioning needs.
We are confident that customers will be able to find the models that best suit their needs.

This service manual contains information regarding the servicing of water cooled VRV System.

January 2007

After Sales Service Division

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General Information

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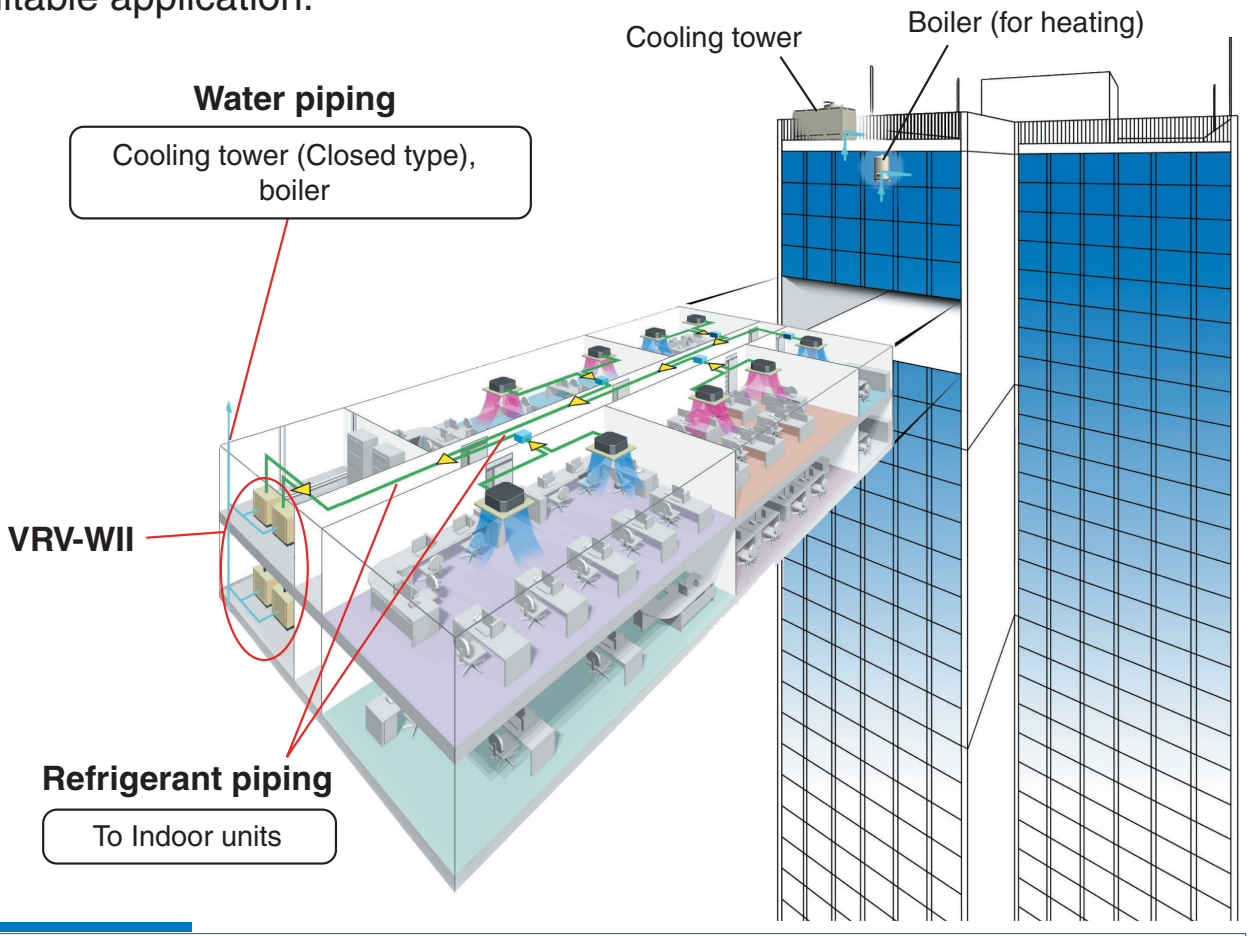
1. Features

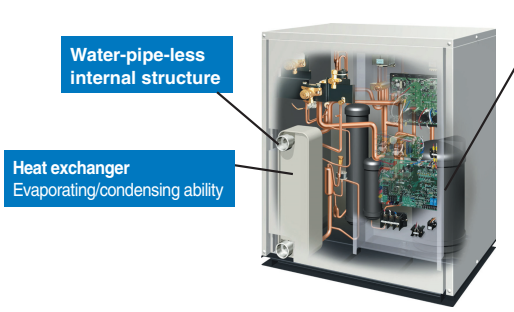
A water cooled intelligent individual air conditioning system suitable for tall multistoried buildings.

This unique system can perform as heat pump or heat recovery to any suitable application.

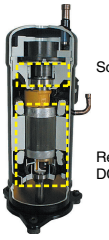


Cutting-edge technologies

The compact unit is packed with the latest technologies.

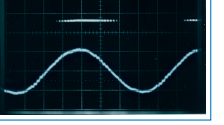


High thrust mechanism



Smooth sine wave DC Inverter

By adoption of the Sine Wave which smoothes rotation of motor, operation efficiency is improved sharply.

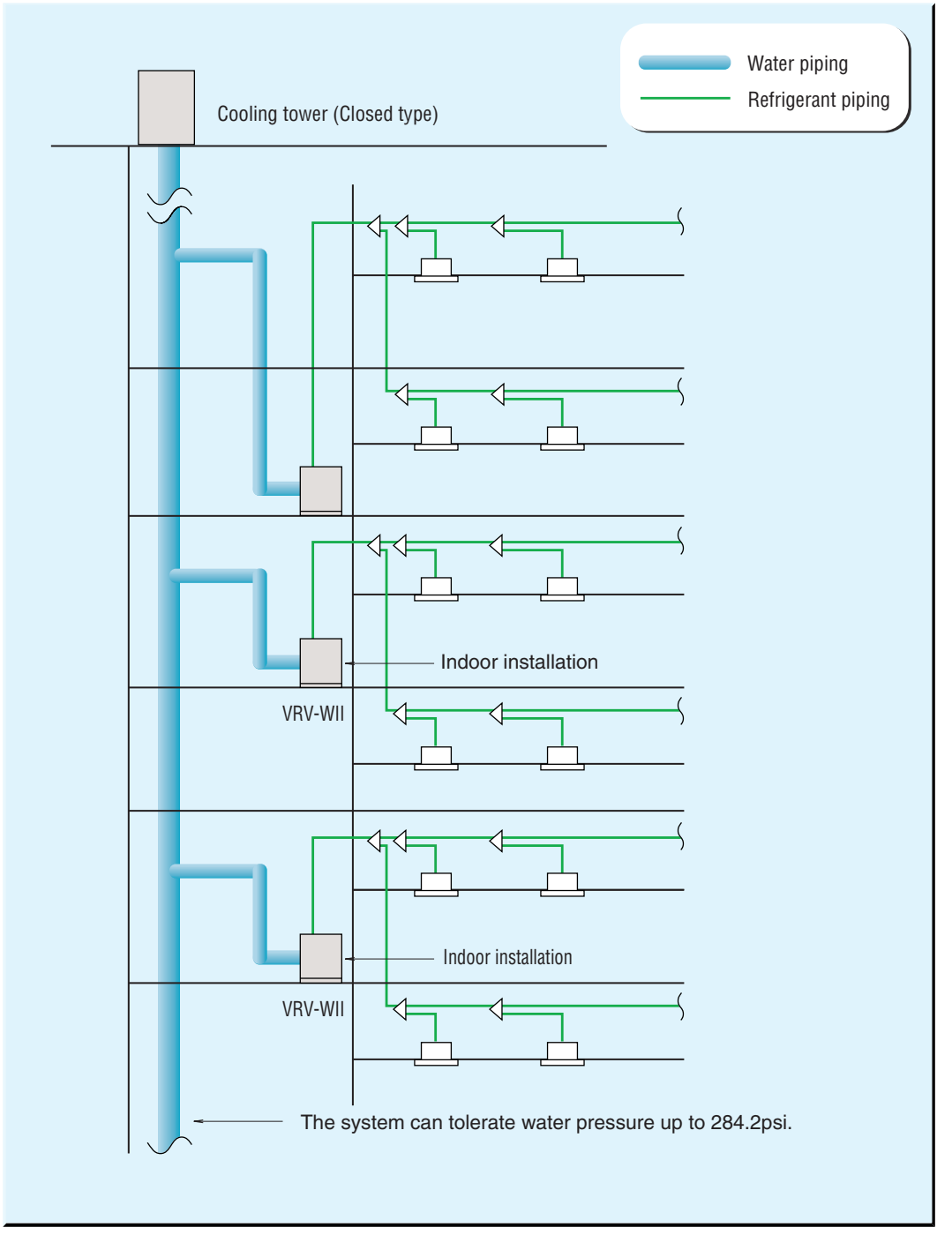


1.1 Design flexibility

Enhanced design flexibility

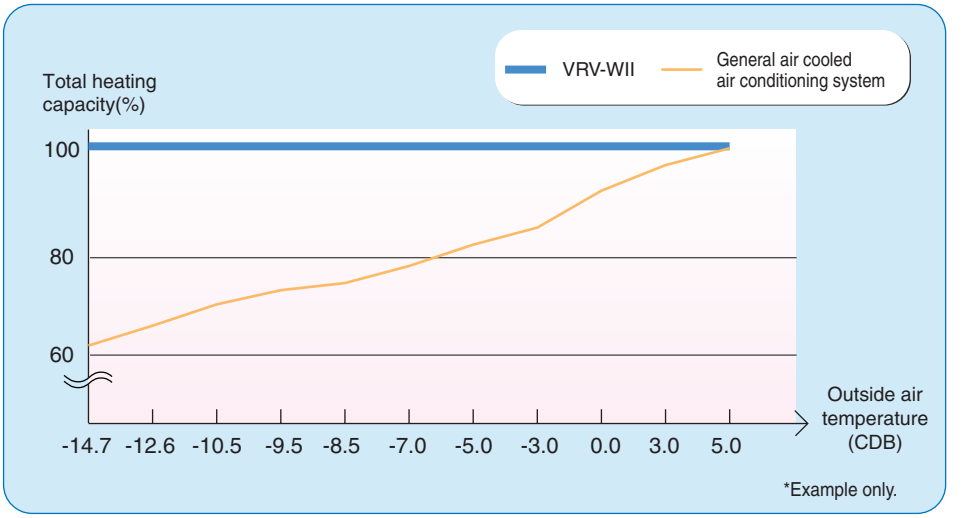
Water cooled VRV II uses water as its heat source so is eminently suitable for tall multistory or large buildings because the system can tolerate up to 284.2psi water pressure. Furthermore, if the currently installed heat source water temperature is between 50°F and 113°F, it may be possible to use the existing water pipe work and heat source. This alone makes it an ideal system solution for building refurbishment projects.

* Prior consultation is necessary about the heat source equipment. Contact your Daikin dealer for details.



Cold climate capability

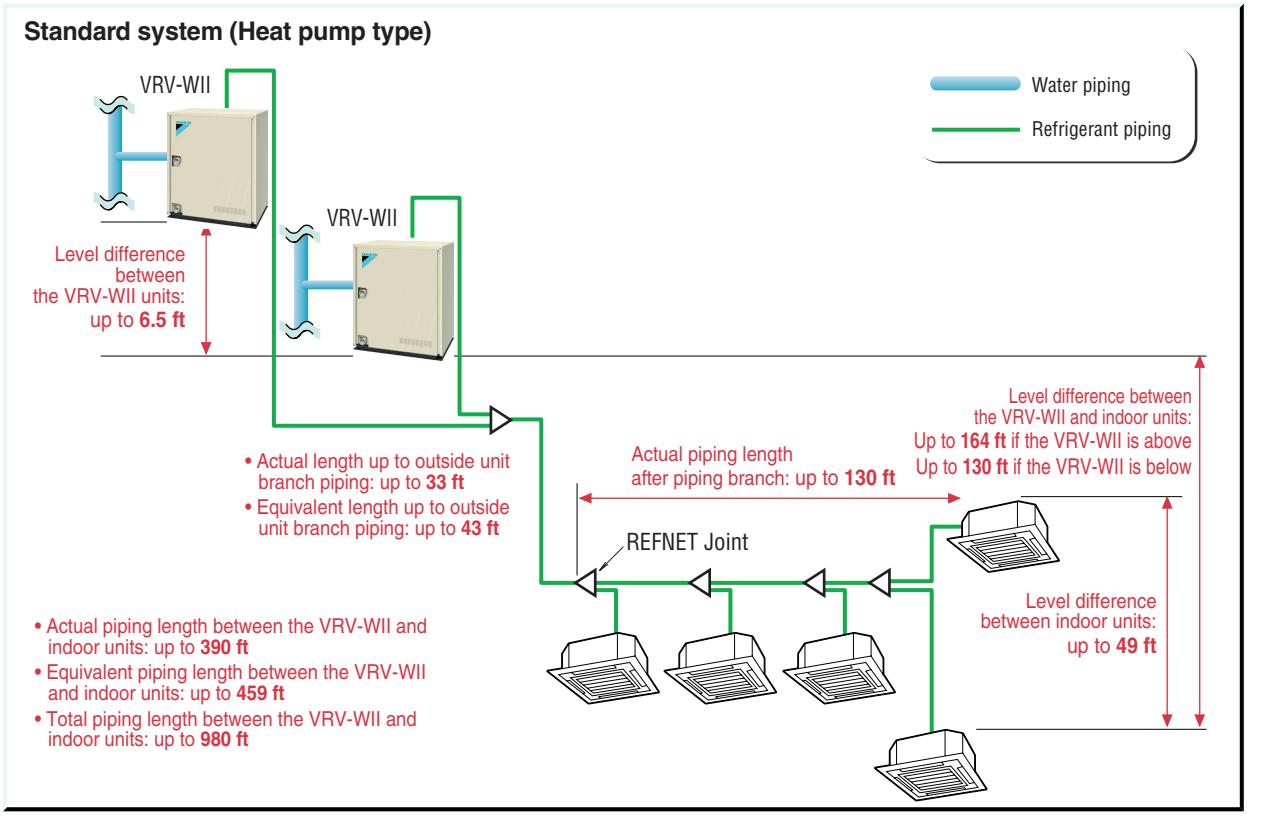
Because the system is water cooled, the outside air temperature does not affect capacity. Furthermore, water cooling means no defrost operation is required, so rapid starting assures quick and comfortable heating in the coldest conditions.



Long refrigerant piping length

Within the refrigerant piping system, up to 390 ft of actual piping length and 164 ft★ of height difference between the VRV-WII and indoor units are possible. Water piping does not enter occupied spaces, so there is no worry of water leaking.

★ If the VRV-WII is above indoor units. 131 ft if the VRV-WII is below indoor units.

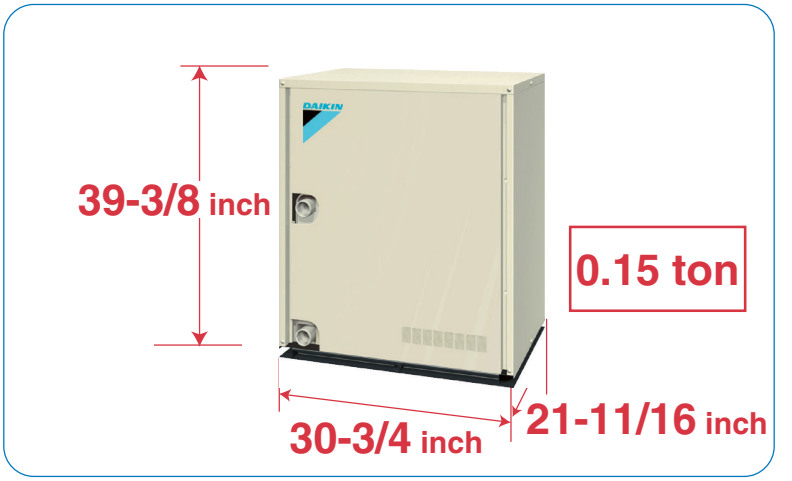


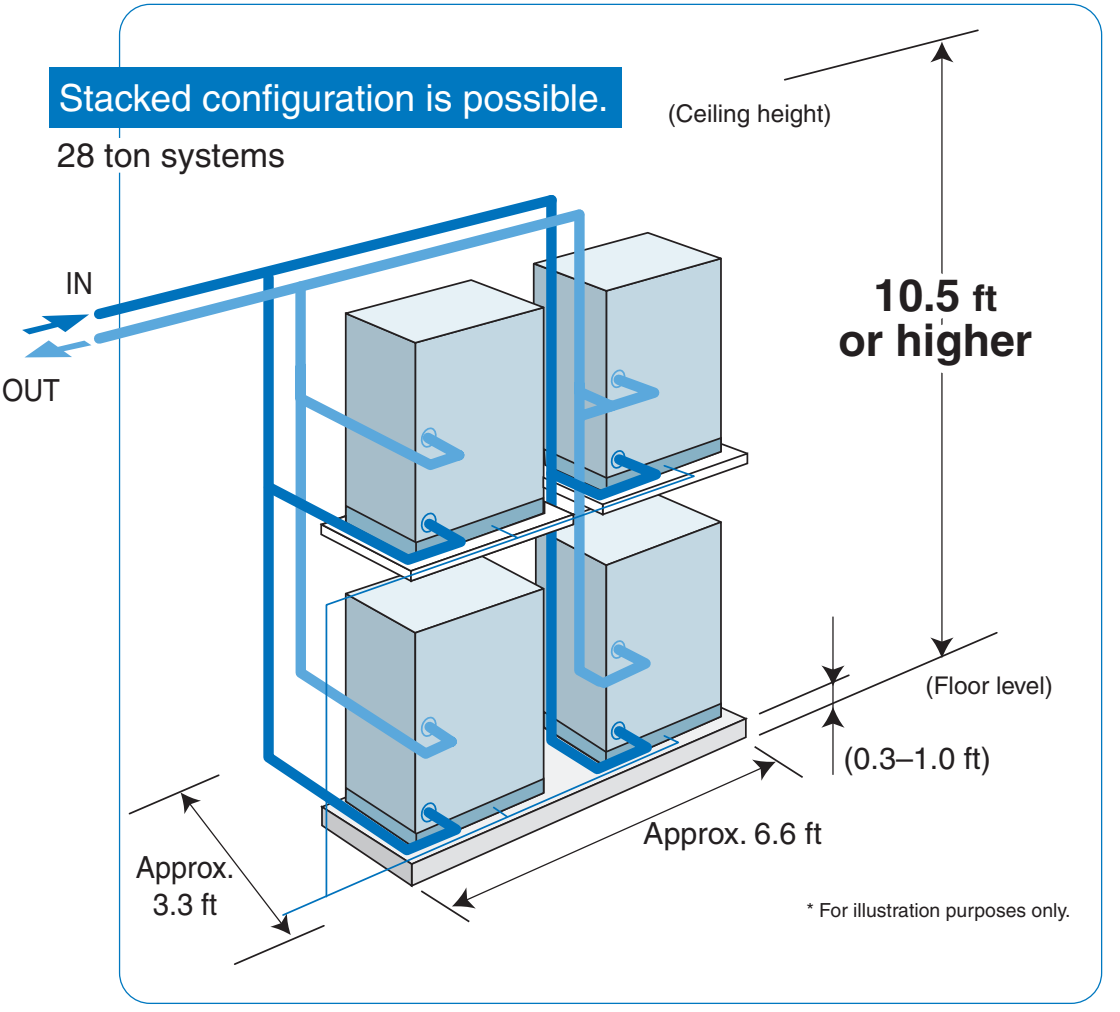
1.2 Easy installation

Compact and lightweight

Adoption of a new water heat exchanger and optimization of the refrigerant control circuit has resulted in the Industry's most compact and lightweight equipment. A weight of 0.15 ton and height of 39-3/8 inch make installation possible in buildings with limited space, or where no space is available for outside units. This makes the system ideal for places that have no area outside—such as underground malls. Stacked configuration is also possible, further contributing to space savings.

* Unit is designed for indoor installation only.

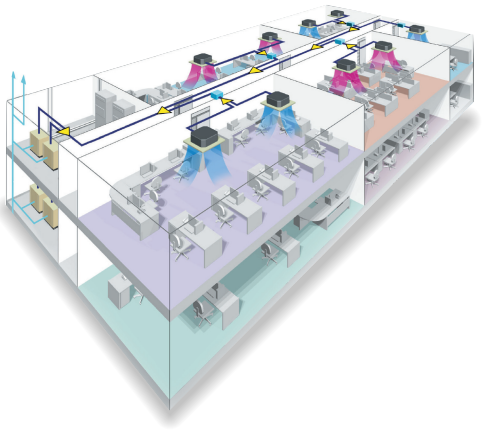




1.3 Energy saving

Heat recovery

Daikin now offers 2-stage heat recovery operation.
The first stage of heat recovery operation is within the refrigerant system. By controlling the BS unit that switches cooling and heating, simultaneous cooling and heating operation is made possible, with heat recovery performed between indoor units.
The second stage of heat recovery operation is within the water loop, where heat recovery is performed between the VRV-WII units.
This 2-stage heat recovery operation substantially improves energy efficiency and makes the system the ideal solution to the requirements of modern office buildings, where some areas may require cooling even in winter, depending on the amount of sunshine received and the number of people in the room.

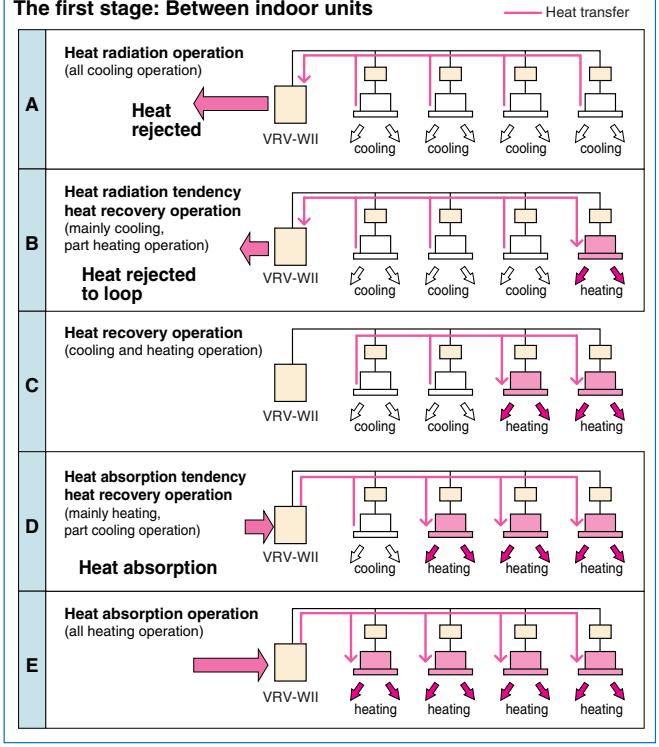


Stage 1

Simultaneous heating and cooling operation within the refrigerant system.

In mainly cooling, partly heating mode, the system recycles heat exhausted from the cooling operation to use for heating. In mainly heating, partly cooling mode, the system uses cooled post-heating operation refrigerant for cooling. Efficiency improves the more simultaneous operation is performed.

The first stage: Between indoor units

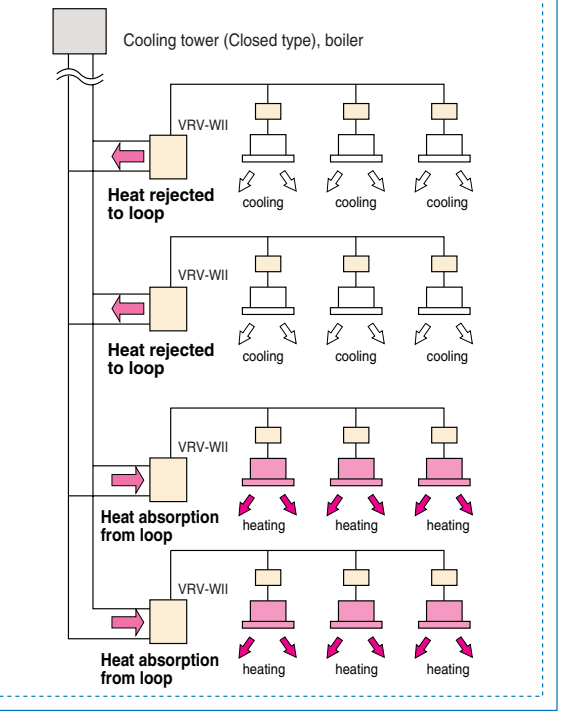


Stage 2

Heat recovery operation between the VRV-WII units.

Heat recovery operation is also available between systems connected to the same water loop, with systems exchanging heat via water. This increases energy efficiency.

The second stage: Between VRV-WII units



Notes: • Operation modes (A) and (E) are applicable when the outside temperature is 95˚F and 32˚F respectively; The other modes are applicable under typical outside conditions.
• Above system configurations are for illustration purposes only.

1.4 Enhanced usability

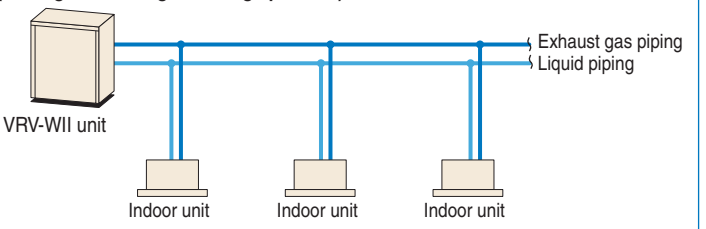
A variety of functions that realize easy installation and improve reliability

- Features a pump interlock function that controls the pump of the heat source simultaneously with the starting of the VRV-WII unit. This significantly simplifies operation and management.
- Employs DIII-NET to enable the shared use of the wiring between the indoor units, the VRV-WII unit and the central control wiring.
- Provides an auto address setting function and check function that detects connection errors in wiring and piping for easier installation.
- Water piping goes only to the VRV-WII unit, with refrigerant piping run in occupied spaces, making the system ideal for installing in spaces such as OA rooms, with no worry of water leakage or corrosion.

Easily responds to simultaneous heating and cooling needs.

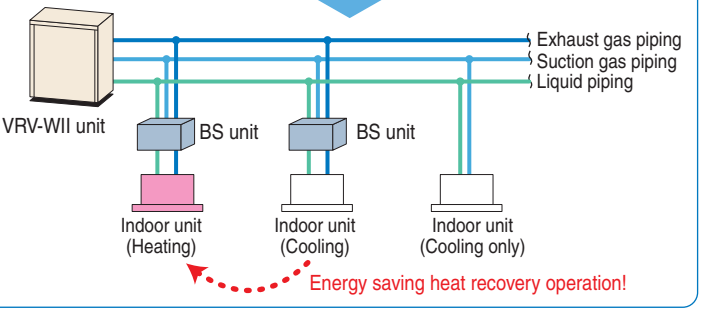
By adding suction gas piping and a BS unit (sold separately), simultaneous heating and cooling operation can be provided by a single system.

Standard system (heating and cooling switching operation)



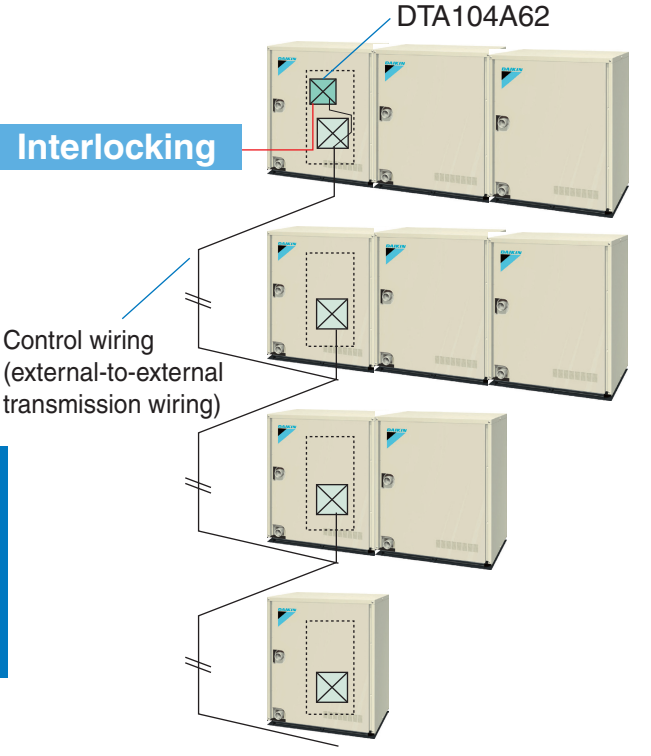
Simultaneous heating and cooling operation system

By adding suction gas piping and a BS unit...



Centralized interlocking function

Centralized interlocking input is possible using an external control adaptor (DTA104A62).



By using one external control adaptor circuit board, centralized interlocking input to multiple units within the same water system is possible.

1.5 Outside unit lineup

A lineup of 5 ton to 21 ton models precisely meets wide-ranging office space requirements. The modular design imparts a simple and smart appearance and makes units easy to install.

RWEYQ60MTJU

Combination table for VRV-WII

Capacity Range	Model	Combination
5 ton	RWEYQ60MTJU	RWEYQ60MTJU
6 ton	RWEYQ72MTJU	RWEYQ72MTJU
7 ton	RWEYQ84MTJU	RWEYQ84MTJU
12 ton	RWEYQ144MTJU	RWEYQ72MTJU×2
14 ton	RWEYQ168MTJU	RWEYQ84MTJU×2
18 ton	RWEYQ216MTJU	RWEYQ72MTJU×3
21 ton	RWEYQ252MTJU	RWEYQ84MTJU×3

* An outside unit multi connection piping kit (optional) is necessary for connection.

Series Lineup

Series	Capacity Range						
	5	6	7	12	14	18	21
Heat pump type	●	●	●	●	●	●	●
Heat recovery type	●	●	●	●	●	●	●

5~7 ton 12·14 ton 18·21 ton

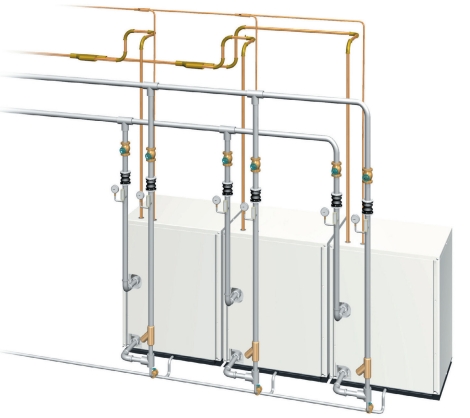
Numbers of connectable indoor units [60Hz]

Capacity Range	5 ton	6 ton	7 ton	12 ton	14 ton	18 ton	21 ton
Model	RWEYQ60MTJU	RWEYQ72MTJU	RWEYQ84MTJU	RWEYQ144M	RWEYQ168M	RWEYQ216M	RWEYQ252M
Number of connectable indoor units	Up to 10	Up to 12	Up to 14	Up to 20		Up to 22	Up to 32
Number of connectable BS units	Up to 10	Up to 12	Up to 14	Up to 20		Up to 22	Up to 32
Connectable capacity	60–130% of the rated capacity of the VRV-WII	50–130% of the rated capacity of the VRV-WII					

Example system layouts (Heat pump system)

* For illustration purposes only.

21 ton



2. Model Names

2.1 Water Cooled System

2.1.1 Indoor Units

Type		Model Name								Power Supply
Ceiling Mounted Cassette Type (Multi Flow)	FXFQ	—	—	12M	18M	24M	30M	36M	—	VJ
Slim Ceiling Mounted Duct Type	FXDQ	07M	09M	12M	18M	24M	—	—	—	
Ceiling Mounted Built-In Type	FXSQ	—	—	12M	18M	24M	30M	36M	48M	
Ceiling Mounted Duct Type	FXMQ	—	—	—	—	—	30M	36M	48M	
Ceiling Suspended Type	FXHQ	—	—	12M	—	24M	—	36M	—	
Wall Mounted Type	FXAQ	07M	09M	12M	18M	24M	—	—	—	
Floor Standing Type	FXLQ	—	—	12M	18M	24M	—	—	—	
Concealed Floor Standing Type	FXNQ	—	—	12M	18M	24M	—	—	—	

New Range of Indoor Units in EDUS39-600-F6

BS Units

Series		Model Name		Power Supply
Heat Recovery Series	BSVQ	36M	60M	VJ

2.1.2 Outside Units (Inverter Series)

Series		Model Name								Power Supply
Inverter	Heat Pump / Heat Recovery	RWEYQ	60M	72M	84M	144M	168M	216M	252M	TJ

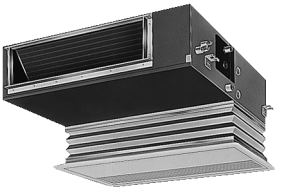
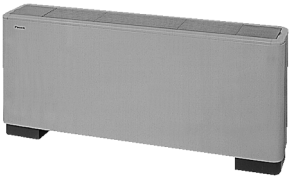
VJ: 1ϕ, 208~230V, 60Hz

TJ: 3ϕ, 208~230V, 60Hz

New Range of Outside Units in EDUS30-607

3. External Appearance

3.1 Indoor Units

Ceiling mounted cassette type (Multi flow) FXFQ12MVJU FXFQ18MVJU FXFQ24MVJU FXFQ30MVJU FXFQ36MVJU 	Ceiling suspended type FXHQ12MVJU FXHQ24MVJU FXHQ36MVJU
Slim ceiling mounted duct type FXDQ07MVJU FXDQ09MVJU FXDQ12MVJU FXDQ18MVJU FXDQ24MVJU 	Wall mounted type **FXAQ07MVJU** **FXAQ09MVJU** FXAQ12MVJU FXAQ18MVJU FXAQ24MVJU
Ceiling mounted built-in type FXSQ12MVJU FXSQ18MVJU FXSQ24MVJU FXSQ30MVJU FXSQ36MVJU FXSQ48MVJU 	Floor standing type FXLQ12MVJU FXLQ18MVJU FXLQ24MVJU 
Ceiling mounted duct type FXMQ30MVJU FXMQ36MVJU FXMQ48MVJU 	Concealed floor standing type FXNQ12MVJU FXNQ18MVJU FXNQ24MVJU

BS Units BSVQ36MVJU BSVQ60MVJU

3.2 Outside Units

RWEYQ60MTJU RWEYQ72MTJU RWEYQ84MTJU
5 • 6 • 7 ton
RWEYQ144MTJU RWEYQ168MTJU
12 • 14 ton
RWEYQ216MTJU RWEYQ252MTJU
18 • 21 ton

4. Combination of Outside Units

System Capacity	Number of units	Module			Multi Connection Piping Kit for Outside Unit (Option)
		5ton	6ton	7ton	
5ton	1	●			—
6ton	1		●		—
7ton	1			●	—
12ton	2		●●		BHFP22MA56U, BHFP26MA56U
14ton	2			●●	BHFP22MA56U, BHFP26MA56U
18ton	3		●●●		BHFP22MA84U, BHFP26MA84U
21ton	3			●●●	BHFP22MA84U, BHFP26MA84U

★Note: For multiple connection of 12 ton ~ 21 ton system, an optional Daikin Multi Connection Piping Kit for Outside Unit is required.

5. Capacity Range

Outside Units

Capacity Range	5ton	6ton	7ton	12ton	14ton	18ton	21ton
RWEYQ	60M	72M	84M	144M	168M	216M	252M
Max. Number of Connectable Indoor Units	10	12	14	20	20	22	32
Total Capacity Index of Indoor Units to be Connected	36 ~ 78	36 ~ 93.5	42 ~ 109	72 ~ 187	84 ~ 218	108 ~ 280	126 ~ 327.5

Indoor Units

Capacity Range		0.6ton	0.8ton	1ton	1.5ton	2ton	2.5ton	3ton	4ton
Capacity Index		7.5	9.5	12	18	24	30	36	48
Ceiling Mounted Cassette Type (Multi Flow)	FXFQ	—	—	12M	18M	24M	30M	36M	—
Slim ceiling Mounted Duct Type	FXDQ	07M	09M	12M	18M	24M	—	—	—
Ceiling Mounted Built-in Type	FXSQ	—	—	12M	18M	24M	30M	36M	48M
Ceiling Mounted Duct Type	FXMQ	—	—	—	—	—	30M	36M	48M
Ceiling Suspended Type	FXHQ	—	—	12M	—	24M	—	36M	—
Wall Mounted Type	FXAQ	07M	09M	12M	18M	24M	—	—	—
Floor Standing Type	FXLQ	—	—	12M	18M	24M	—	—	—
Connected Floor Standing Type	FXNQ	—	—	12M	18M	24M	—	—	—

Part 2
Specifications

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1. Specifications

1.1 Outside Units

Model Name			RWEYQ60MTJU
★1 Cooling Capacity		Btu / h	60,000
★2 Heating Capacity		Btu / h	67,500
Casing Color			Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in	39-3/8×30-3/4×21-11/16
Heat Exchanger			Stainless Steel Plate Type
Comp.	Type		Hermetically Sealed Scroll Type
	Piston Displacement	m^3/h	9.21
	Number of Revolutions	r.p.m	4,350
	Motor Output×Number of Units	kW	3.2
	Starting Method		Soft Start
Connecting Pipes	Liquid Pipe	in	3/8 in C1220T (Flare Connection)
	Suction Gas Pipe	in	3/4 in C1220T (Brazing Connection) ★3
	Discharge Gas Pipe	in	★4 5/8 in C1220T, ★5 3/4 in C1220T (Brazing Connection)
	Water inlet		1 1/4 FPT Female Thread
	Water outlet		1 1/4 FPT Female Thread
	Drain outlet		1/2 FPS Female Thread
Machine Weight (Mass)		Lbs	330
Sound Level (Reference Value)		dBA	50
Safety Devices			High Pressure Switch, Inverter Overload Protector, Fusible Plugs
Capacity Control		%	23~100
Refrigerant	Refrigerant Name		R-410A
	Charge	Lbs	9.9
	Control		Electronic Expansion Valve
Refrigerator Oil			Synthetic (Ether) Oil
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps, Strainer, Conduit Mounting Plate
Drawing No.			4D054570D

Notes:

1. ★1 Indoor temp. : 80°FDB, 67°FWB / inlet water temp. : 85°F / outlet water temp. : 95°F
   Equivalent piping length : 25ft, level difference : 0ft.
   ★2 Indoor temp. : 70°FDB, 60°FWB / inlet water temp. : 70°F / Equivalent piping length : 25ft, level difference : 0ft.
   ★3 In the case of heat pump system, suction gas pipe is not used.
   ★4 In the case of heat recovery system.
   ★5 In the case of heat pump system.
2. This unit cannot be installed outdoors.
   Install indoors (Machine room etc.).
3. Hold ambient condition at 35~95°F, ~80%RH
   Heat rejection from the casing : 0.64kW
4. There are some cases where capacity decreases depending on operating states.

Model Name			RWEYQ72MTJU
★1 Cooling Capacity		Btu / h	72,000
★2 Heating Capacity		Btu / h	81,000
Casing Color			Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in	39-3/8×30-3/4×21-11/16
Heat Exchanger			Stainless Steel Plate Type
Comp.	Type		Hermetically Sealed Scroll Type
	Piston Displacement	m³/h	11.18
	Number of Revolutions	r.p.m	5,280
	Motor Output×Number of Units	kW	3.6
	Starting Method		Soft Start
Connecting Pipes	Liquid Pipe	in	3/8 in C1220T (Flare Connection)
	Suction Gas Pipe	in	3/4 in C1220T (Brazing Connection) ★3
	Discharge Gas Pipe	in	★4 5/8 in C1220T, ★5 3/4 in C1220T (Brazing Connection)
	Water inlet		1 1/4 FPT Female Thread
	Water outlet		1 1/4 FPT Female Thread
	Drain outlet		1/2 FPS Female Thread
Machine Weight (Mass)		Lbs	330
Sound Level (Reference Value)		dBA	50
Safety Devices			High Pressure Switch, Inverter Overload Protector, Fusible Plugs
Capacity Control		%	23~100
Refrigerant	Refrigerant Name		R-410A
	Charge	Lbs	9.9
	Control		Electronic Expansion Valve
Refrigerator Oil			Synthetic (Ether) Oil
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps, Strainer, Conduit Mounting Plate
Drawing No.			4D054571D

Notes:

1. ★1 Indoor temp. : 80°FDB, 67°FWB / inlet water temp. : 85°F / outlet water temp. : 95°F
   Equivalent piping length : 25ft, level difference : 0ft.
   ★2 Indoor temp. : 70°FDB, 60°FWB / inlet water temp. : 70°F / Equivalent piping length : 25ft, level difference : 0ft.
   ★3 In the case of heat pump system, suction gas pipe is not used.
   ★4 In the case of heat recovery system.
   ★5 In the case of heat pump system.
2. This unit cannot be installed outdoors.
   Install indoors (Machine room etc.).
3. Hold ambient condition at 35~95°F, ~80%RH
   Heat rejection from the casing : 0.64kW
4. There are some cases where capacity decreases depending on operating states.

Model Name (Combination Unit)			RWEYQ84MTJU
★1 Cooling Capacity		Btu / h	84,000
★2 Heating Capacity		Btu / h	94,500
Casing Color			Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in	39-3/8×30-3/4×21-11/16
Heat Exchanger			Stainless Steel Plate Type
Comp.	Type		Hermetically Sealed Scroll Type
	Piston Displacement	m³/h	13.66
	Number of Revolutions	r.p.m	6,450
	Motor Output×Number of Units	kW	4.0
	Starting Method		Soft Start
Connecting Pipes	Liquid Pipe	in	3/8 in C1220T (Flare Connection)
	Suction Gas Pipe	in	7/8 in C1220T (Brazing Connection) ★3
	Discharge Gas Pipe	in	★4 3/4 in C1220T, ★5 7/8 in C1220T (Brazing Connection)
	Water inlet		1 1/4 FPT Female Thread
	Water outlet		1 1/4 FPT Female Thread
	Drain outlet		1/2 FPS Female Thread
Machine Weight (Mass)		Lbs	330
Sound Level (Reference Value)		dBA	51
Safety Devices			High Pressure Switch, Inverter Overload Protector, Fusible Plugs
Capacity Control		%	23~100
Refrigerant	Refrigerant Name		R-410A
	Charge	Lbs	11.5
	Control		Electronic Expansion Valve
Refrigerator Oil			Synthetic (Ether) Oil
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps, Strainer, Conduit Mounting Plate
Drawing No.			4D054572C

Notes:

1. ★1 Indoor temp. : 80°FDB, 67°FWB / inlet water temp. : 85°F / outlet water temp. : 95°F
   Equivalent piping length : 25ft, level difference : 0ft.
   ★2 Indoor temp. : 70°FDB, 60°FWB / inlet water temp. : 70°F / Equivalent piping length : 25ft, level difference : 0ft.
   ★3 In the case of heat pump system, suction gas pipe is not used.
   ★4 In the case of heat recovery system.
   ★5 In the case of heat pump system.
2. This unit cannot be installed outdoors.
   Install indoors (Machine room etc.).
3. Hold ambient condition at 35~95°F, ~80%RH
   Heat rejection from the casing : 0.71kW
4. There are some cases where capacity decreases depending on operating states.

Model Name (Combination Unit)			RWEYQ144MTJU
Model Name (Combination Unit)			RWEYQ72MTJU+RWEYQ72MTJU
★1 Cooling Capacity		Btu / h	144,000
★2 Heating Capacity		Btu / h	162,000
Casing Color			Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in	(39-3/8×30-3/4×21-11/16)×2
Heat Exchanger			Stainless Steel Plate Type
Comp.	Type		Hermetically Sealed Scroll Type
	Piston Displacement	m³/h	11.18×2
	Number of Revolutions	r.p.m	5,280×2
	Motor Output×Number of Units	kW	3.6×2
	Starting Method		Soft Start
Connecting Pipes	Liquid Pipe	in	1/2 in C1220T (Flare Connection) -Main Line-
	Suction Gas Pipe	in	1-1/8 in C1220T (Brazing Connection) ★3 -Main Line-
	Discharge Gas Pipe	in	★4 7/8 in C1220T, ★5 1-1/8 in C1220T (Brazing Connection) -Main Line-
	Water inlet		1 1/4 FPT Female Thread
	Water outlet		1 1/4 FPT Female Thread
	Drain outlet		1/2 FPS Female Thread
Machine Weight (Mass)		Lbs	330+330
Safety Devices			High Pressure Switch, Inverter Overload Protector, Fusible Plugs
Capacity Control		%	11~100
Refrigerant	Refrigerant Name		R-410A
	Charge	Lbs	9.9+9.9
	Control		Electronic Expansion Valve
Refrigerator Oil			Synthetic (Ether) Oil
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps, Strainer, Conduit Mounting Plate
Drawing No.			4D054573D

Notes:

1. ★1 Indoor temp. : 80°FDB, 67°FWB / inlet water temp. : 85°F / outlet water temp. : 95°F
   Equivalent piping length : 25ft, level difference : 0ft.
   ★2 Indoor temp. : 70°FDB, 60°FWB / inlet water temp. : 70°F / Equivalent piping length : 25ft, level difference : 0ft.
   ★3 In the case of heat pump system, suction gas pipe is not used.
   ★4 In the case of heat recovery system.
   ★5 In the case of heat pump system.
2. This unit cannot be installed outdoors.
   Install indoors (Machine room etc.).
3. Hold ambient condition at 35~95°F, ~80%RH
   Heat rejection from the casing : 0.64kW×2
4. There are some cases where capacity decreases depending on operating states.

Model Name (Combination Unit)			**RWEYQ168MTJU**
Model Name (Combination Unit)			**RWEYQ84MTJU+RWEYQ84MTJU**
★1 Cooling Capacity		Btu / h	168,000
★2 Heating Capacity		Btu / h	189,000
Casing Color			Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in	(39-3/8×30-3/4×21-11/16)×2
Heat Exchanger			Stainless Steel Plate Type
Comp.	Type		Hermetically Sealed Scroll Type
	Piston Displacement	m³/h	13.66×2
	Number of Revolutions	r.p.m	6,450×2
	Motor Output×Number of Units	kW	4.0×2
	Starting Method		Soft Start
Connecting Pipes	Liquid Pipe	in	5/8 in C1220T (Flare Connection) -Main Line-
	Suction Gas Pipe	in	1-1/8 in C1220T (Brazing Connection) ★3 -Main Line-
	Discharge Gas Pipe	in	★4 7/8 in C1220T, ★5 1-1/8 in C1220T (Brazing Connection) -Main Line-
	Water inlet		1 1/4 FPT Female Thread
	Water outlet		1 1/4 FPT Female Thread
	Drain outlet		1/2 FPS Female Thread
Machine Weight (Mass)		Lbs	330+330
Safety Devices			High Pressure Switch, Inverter Overload Protector, Fusible Plugs
Capacity Control		%	11~100
Refrigerant	Refrigerant Name		R-410A
	Charge	Lbs	11.5+11.5
	Control		Electronic Expansion Valve
Refrigerator Oil			Synthetic (Ether) Oil
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps, Strainer, Conduit Mounting Plate
Drawing No.			4D054574C

Notes:

1. ★1 Indoor temp. : 80°FDB, 67°FWB / inlet water temp. : 85°F / outlet water temp. : 95°F
   Equivalent piping length : 25ft, level difference : 0ft.
   ★2 Indoor temp. : 70°FDB, 60°FWB / inlet water temp. : 70°F / Equivalent piping length : 25ft, level difference : 0ft.
   ★3 In the case of heat pump system, suction gas pipe is not used.
   ★4 In the case of heat recovery system.
   ★5 In the case of heat pump system.
2. This unit cannot be installed outdoors.
   Install indoors (Machine room etc.).
3. Hold ambient condition at 35~95°F, ~80%RH
   Heat rejection from the casing : 0.71kW×2
4. There are some cases where capacity decreases depending on operating states.

Model Name (Combination Unit)			RWEYQ216MTJU
Model Name (Combination Unit)			RWEYQ72MTJU+RWEYQ72MTJU+RWEYQ72MTJU
★1 Cooling Capacity		Btu / h	216,000
★2 Heating Capacity		Btu / h	243,000
Casing Color			Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in	(39-3/8×30-3/4×21-11/16)×3
Heat Exchanger			Stainless Steel Plate Type
Comp.	Type		Hermetically Sealed Scroll Type
	Piston Displacement	m³/h	11.18×3
	Number of Revolutions	r.p.m	5,280×3
	Motor Output×Number of Units	kW	3.6×3
	Starting Method		Soft Start
Connecting Pipes	Liquid Pipe	in	5/8 in C1220T (Flare Connection) -Main Line-
	Suction Gas Pipe	in	1-3/8 in C1220T (Brazing Connection) ★3 -Main Line-
	Discharge Gas Pipe	in	★4 1-1/8 in C1220T, ★5 1-3/8 in C1220T (Brazing Connection) -Main Line-
	Water inlet		1 1/4 FPT Female Thread
	Water outlet		1 1/4 FPT Female Thread
	Drain outlet		1/2 FPS Female Thread
Machine Weight (Mass)		Lbs	330+330+330
Safety Devices			High Pressure Switch, Inverter Overload Protector, Fusible Plugs
Capacity Control		%	8~100
Refrigerant	Refrigerant Name		R-410A
	Charge	Lbs	9.9+9.9+9.9
	Control		Electronic Expansion Valve
Refrigerator Oil			Synthetic (Ether) Oil
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps, Strainer, Conduit Mounting Plate
Drawing No.			4D054575D

Notes:

1. ★1 Indoor temp. : 80°FDB, 67°FWB / inlet water temp. : 85°F / outlet water temp. : 95°F
   Equivalent piping length : 25ft, level difference : 0ft.
   ★2 Indoor temp. : 70°FDB, 60°FWB / inlet water temp. : 70°F / Equivalent piping length : 25ft, level difference : 0ft.
   ★3 In the case of heat pump system, suction gas pipe is not used.
   ★4 In the case of heat recovery system.
   ★5 In the case of heat pump system.
2. This unit cannot be installed outdoors.
   Install indoors (Machine room etc.).
3. Hold ambient condition at 35~95°F, ~80%RH
   Heat rejection from the casing : 0.64kW×3
4. There are some cases where capacity decreases depending on operating states.

Model Name (Combination Unit)			**RWEYQ252MTJU**
Model Name (Combination Unit)			**RWEYQ84MTJU+RWEYQ84MTJU+RWEYQ84MTJU**
★1 Cooling Capacity		Btu / h	252,000
★2 Heating Capacity		Btu / h	283,500
Casing Color			Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in	(39-3/8×30-3/4×21-11/16)×3
Heat Exchanger			Stainless Steel Plate Type
Comp.	Type		Hermetically Sealed Scroll Type
	Piston Displacement	m^3/h	13.66×3
	Number of Revolutions	r.p.m	6,450×3
	Motor Output×Number of Units	kW	4.0×3
	Starting Method		Soft Start
Connecting Pipes	Liquid Pipe	in	3/4 in C1220T (Flare Connection) -Main Line-
	Suction Gas Pipe	in	1-3/4 in C1220T (Brazing Connection) ★3 -Main Line-
	Discharge Gas Pipe	in	★4 1-1/8 in C1220T, ★5 1-3/8 in C1220T (Brazing Connection) -Main Line-
	Water inlet		1 1/4 FPT Female Thread
	Water outlet		1 1/4 FPT Female Thread
	Drain outlet		1/2 FPS Female Thread
Machine Weight (Mass)		Lbs	330+330+330
Safety Devices			High Pressure Switch, Inverter Overload Protector, Fusible Plugs
Capacity Control		%	8~100
Refrigerant	Refrigerant Name		R-410A
	Charge	Lbs	11.5+11.5+11.5
	Control		Electronic Expansion Valve
Refrigerator Oil			Synthetic (Ether) Oil
Standard Accessories			Installation Manual, Operation Manual, Connection Pipes, Clamps, Strainer, Conduit Mounting Plate
Drawing No.			4D054576C

Notes:

1. ★1 Indoor temp. : 80°FDB, 67°FWB / inlet water temp. : 85°F / outlet water temp. : 95°F
   Equivalent piping length : 25ft, level difference : 0ft.
   ★2 Indoor temp. : 70°FDB, 60°FWB / inlet water temp. : 70°F / Equivalent piping length : 25ft, level difference : 0ft.
   ★3 In the case of heat pump system, suction gas pipe is not used.
   ★4 In the case of heat recovery system.
   ★5 In the case of heat pump system.
2. This unit cannot be installed outdoors.
   Install indoors (Machine room etc.).
3. Hold ambient condition at 35~95°F, ~80%RH
   Heat rejection from the casing : 0.71kW×3
4. There are some cases where capacity decreases depending on operating states.

1.2 BS Units

Model				BSVQ36MVJU	BSVQ60MVJU
Power Supply				60Hz 208~230V	60Hz 208~230V
Total Capacity Index of Connectable Indoor Unit				Less than 36	Less than 60
No. of Connectable Indoor Units				Max. 3	Max. 5
Casing				Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)			in	7-1/4 × 12-1/4 × 11	7-1/4 × 12-1/4 × 11
Sound Absorbing Thermal Insulation Material				Flame and Heat Resistant Foamed Polyethylene	Flame and Heat Resistant Foamed Polyethylene
Piping Connection	Indoor Unit	Liquid Pipes		ϕ 3/8 (Flare Connection) ★1	ϕ 3/8 (Flare Connection)
		Gas Pipes		ϕ 5/8 (Flare Connection) ★1	ϕ 5/8 (Flare Connection)
	Outside Unit	Liquid Pipes		ϕ 3/8 (Flare Connection) ★1	ϕ 3/8 (Flare Connection)
		Suction Gas Pipes		ϕ 5/8 (Flare Connection) ★1	ϕ 5/8 (Flare Connection)
		Discharge Gas Pipes		ϕ 1/2 (Flare Connection) ★1	ϕ 1/2 (Flare Connection)
Machine Weight (Mass)			Lbs	18	18
Standard Accessories				Installation Manual, Attached Pipe, Insulation pipe cover, Clamps	Installation Manual, Insulation pipe cover, Clamps
Drawing No.				4D045334	4D045339

Note:

★1 If the total capacity of all indoor units connected to the system is less than 24,000 Btu/h, connect the attached pipe to the field pipe.
(Braze the connection between the attached pipe and field pipe.)

1.3 Indoor Units

Ceiling Mounted Cassette Type (Multi-Flow)

Model			FXFQ12MVJU	FXFQ18MVJU	FXFQ24MVJU
★1 Cooling Capacity		Btu/h	12,000	18,000	24,000
★2 Heating Capacity		Btu/h	13,500	20,000	27,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in	9-1/8×33-1/8×33-1/8	9-1/8×33-1/8×33-1/8	9-1/8×33-1/8×33-1/8
Coil (Cross Fin Coil)	Rows×Stages×FPI		2×8×17	2×8×17	2×8×17
	Face Area	ft²	3.56	3.56	3.56
Fan	Model		QTS45B14M	QTS45B14M	QTS45B14M
	Type		Turbo Fan	Turbo Fan	Turbo Fan
	Motor Output	HP	0.06	0.06	0.06
	Air Flow Rate (H/L)	cfm	460/350	570/390	670/490
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene
Piping Connections	Liquid Pipes	in	ϕ1/4 (Flare Connection)	ϕ1/4 (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in	ϕ1/2 (Flare Connection)	ϕ1/2 (Flare Connection)	ϕ5/8 (Flare Connection)
	Drain Pipe	in	VP25 (External Dia. 1-1/4 Internal Dia. 1)	VP25 (External Dia. 1-1/4 Internal Dia. 1)	VP25 (External Dia. 1-1/4 Internal Dia. 1)
Machine Weight (Mass)		Lbs	55	55	55
★4 Sound Level (H/L)		dBA	31/28	33/28	34/29
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Decoration Panels (Option)	Model		BYC125K-W1	BYC125K-W1	BYC125K-W1
	Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	in	1-5/8×37-3/8×37-3/8	1-5/8×37-3/8×37-3/8	1-5/8×37-3/8×37-3/8
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	Lbs	11	11	11
Standard Accessories			Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.
Drawing No.			C:3D042686		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Ceiling Mounted Cassette Type (Multi-Flow)

Model			FXFQ30MVJU	FXFQ36MVJU
★1 Cooling Capacity		Btu/h	30,000	36,000
★2 Heating Capacity		Btu/h	34,000	40,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in	11-3/8×33-1/8×33-1/8	11-3/8×33-1/8×33-1/8
Coil (Cross Fin Coil)	Rows×Stages×FPI		2×12×17	2×12×17
	Face Area	ft²	5.35	5.35
Fan	Model		QTS45A17M	QTS45A17M
	Type		Turbo Fan	Turbo Fan
	Motor Output	HP	0.12	0.12
	Air Flow Rate (H/L)	cfm	990/710	990/740
	Drive		Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene
Piping Connections	Liquid Pipes	in	ϕ3/8 (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in	ϕ5/8 (Flare Connection)	ϕ5/8 (Flare Connection)
	Drain Pipe	in	VP25 (External Dia. 1-1/4 Internal Dia. 1)	VP25 (External Dia. 1-1/4 Internal Dia. 1)
Machine Weight (Mass)		Lbs	66	66
★4 Sound Level (H/L)		dBA	38/32	40/33
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series
Decoration Panels (Option)	Model		BYC125K-W1	BYC125K-W1
	Color		White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	in	1-5/8×37-3/8×37-3/8	1-5/8×37-3/8×37-3/8
	Air Filter		Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
	Weight	Lbs	11	11
Standard Accessories			Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.	Operation manual, Installation manual, Paper pattern for installation, Drain hose, Clamp metal, Washers, Sealing pads, Clamps, Screws, Insulation for fitting.
Drawing No.			C:3D042686	

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Slim Ceiling Mounted Duct Type

Model			FXDQ07MVJU	FXDQ09MVJU	FXDQ12MVJU
★1 Cooling Capacity		Btu/h	7,500	9,500	12,000
★2 Heating Capacity		Btu/h	8,500	10,500	13,500
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in	7-7/8×27-9/16×24-7/16	7-7/8×27-9/16×24-7/16	7-7/8×27-9/16×24-7/16
Coil (Cross Fin Coil)	Rows×Stages×FPI		2×12×17	2×12×17	3×12×17
	Face Area	ft²	1.36	1.36	1.36
Fan	Model		—	—	—
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.08	0.08	0.08
	Air Flow Rate (H/L)	cfm	280/226 (H/L)	280/226 (H/L)	280/226 (H/L)
	External Static Pressure ★4	Pa	30-10	30-10	30-10
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene
Air Filter			Removal, Washable, Mildew Proof	Removal, Washable, Mildew Proof	Removal, Washable, Mildew Proof
Piping Connections	Liquid Pipes	in	ϕ1/4 (Flare Connection)	ϕ1/4 (Flare Connection)	ϕ1/4 (Flare Connection)
	Gas Pipes	in	ϕ1/2 (Flare Connection)	ϕ1/2 (Flare Connection)	ϕ1/2 (Flare Connection)
	Drain Pipe	in	VP20 (External Dia. 1-1/32 Internal Dia. 25/32)	VP20 (External Dia. 1-1/32 Internal Dia. 25/32)	VP20 (External Dia. 1-1/32 Internal Dia. 25/32)
Machine Weight (Mass)		Lbs	51	51	51
★5 Sound Level (H/L)		dBA	33/29	33/29	33/29
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Conduit Mounting Plate, Insulation Tube.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Conduit Mounting Plate, Insulation Tube.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Conduit Mounting Plate, Insulation Tube.
Drawing No.			C:3D051780A		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
|Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 External static pressure is changeable to change over the connectors inside electrical box, this pressure means " High static pressure – Standard ".

★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Slim Ceiling Mounted Duct Type

Model			FXDQ18MVJU	FXDQ24MVJU
★1 Cooling Capacity		Btu/h	18,000	24,000
★2 Heating Capacity		Btu/h	20,000	27,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in	7-7/8×35-7/16×24-7/16	7-7/8×43-5/16×24-7/16
Coil (Cross Fin Coil)	Rows×Stages×FPI		3×12×17	3×12×17
	Face Area	ft²	1.89	2.44
Fan	Model		—	—
	Type		Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.17	0.17
	Air Flow Rate (H/L)	cfm	440/350 (H/L)	580/460 (H/L)
	External Static Pressure ★4	Pa	44-15	44-15
	Drive		Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polyethylene	Foamed Polyethylene
Air Filter			Removal, Washable, Mildew Proof	Removal, Washable, Mildew Proof
Piping Connections	Liquid Pipes	in	ϕ1/4 (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in	ϕ1/2 (Flare Connection)	ϕ5/8 (Flare Connection)
	Drain Pipe	in	VP20 (External Dia. 1-1/32 Internal Dia. 25/32)	VP20 (External Dia. 1-1/32 Internal Dia. 25/32)
Machine Weight (Mass)		Lbs	63	71
★5 Sound Level (H/L)		dBA	35/31	36/32
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Conduit Mounting Plate, Insulation Tube.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers, Conduit Mounting Plate, Insulation Tube.
Drawing No.			C:3D051780A	

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
|Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 External static pressure is changeable to change over the connectors inside electrical box, this pressure means " High static pressure – Standard ".

★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Ceiling Mounted Built-In Type

Model			FXSQ12MVJU	FXSQ18MVJU	FXSQ24MVJU
★1 Cooling Capacity		Btu/h	12,000	18,000	24,000
★2 Heating Capacity		Btu/h	13,500	20,000	27,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in	11-7/8×21-5/8×31-1/2	11-7/8×27-1/2×31-1/2	11-7/8×39-3/8×31-1/2
Coil (Cross Fin Coil)	Rows×Stages×FPI		3×14×14	3×14×14	3×14×14
	Face Area	ft²	0.95	1.42	2.38
Fan	Model		D18H3A	D18H2A	2D18H2A
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.07	0.11	0.17
	Air Flow Rate (H/L)	cfm	340/230	530/390	740/490
	External Static Pressure ★4	in. Aq	0.37-0.19-0.06	0.38-0.19-0.06	0.51-0.29-0.06
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber	Glass Fiber	Glass Fiber
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	in	ϕ1/4 (Flare Connection)	ϕ1/4 (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in	ϕ1/2 (Flare Connection)	ϕ1/2 (Flare Connection)	ϕ5/8 (Flare Connection)
	Drain Pipe	in	VP25 (External Dia. 1-1/4 Internal Dia. 1)	VP25 (External Dia. 1-1/4 Internal Dia. 1)	VP25 (External Dia. 1-1/4 Internal Dia. 1)
Machine Weight (Mass)		Lbs	69	73	95
★5 Sound Level (H/L)		dBA	41/35	44/38	44/38
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Decoration Panel (Option)	Model		BYBS32DJW1	BYBS45DJW1	BYBS71DJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	in	2-1/8×25-5/8×19-5/8	2-1/8×31-1/2×19-5/8	2-1/8×43-1/4×19-5/8
	Weight	Lbs	6.6	7.7	9.9
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.
Drawing No.			C:3D042684		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 External static pressure is changeable to change over the connectors inside electrical box, this pressure means " High static pressure – Standard – Low static pressure ".

★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Ceiling Mounted Built-In Type

Model			FXSQ30MVJU	FXSQ36MVJU	FXSQ48MVJU
★1 Cooling Capacity		Btu/h	30,000	36,000	48,000
★2 Heating Capacity		Btu/h	34,000	40,000	54,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in	11-7/8×55-1/8×31-1/2	11-7/8×55-1/8×31-1/2	11-7/8×55-1/8×31-1/2
Coil (Cross Fin Coil)	Rows×Stages×FPI		3×14×14	3×14×14	3×14×14
	Face Area	ft²	3.64	3.64	3.64
Fan	Model		3D18H2A	3D18H2A	3D18H2A
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.30	0.30	0.30
	Air Flow Rate (H/L)	cfm	950/720	990/740	1,300/950
	External Static Pressure ★4	in. Aq	0.57-0.39	0.57-0.35	0.34-0.10
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber	Glass Fiber	Glass Fiber
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	in	ϕ3/8 (Flare Connection)	ϕ3/8 (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in	ϕ5/8 (Flare Connection)	ϕ5/8 (Flare Connection)	ϕ5/8 (Flare Connection)
	Drain Pipe	in	VP25 (External Dia. 1-1/4 Internal Dia. 1)	VP25 (External Dia. 1-1/4 Internal Dia. 1)	VP25 (External Dia. 1-1/4 Internal Dia. 1)
Machine Weight (Mass)		Lbs	119	119	122
★5 Sound Level (H/L)		dBA	45/39	45/39	48/43
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Decoration Panel (Option)	Model		BYBS125DJW1	BYBS125DJW1	BYBS125DJW1
	Panel Color		White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
	Dimensions: (H×W×D)	in	2-1/8×59×19-5/8	2-1/8×59×19-5/8	2-1/8×59×19-5/8
	Weight	Lbs	14	14	14
Standard Accessories			Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.	Operation Manual, Installation Manual, Paper Pattern for Installation, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws, Washers.
Drawing No.			C:3D042684		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 External static pressure is changeable to change over the connectors inside electrical box, this pressure means " High static pressure – Standard ".

★5 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Ceiling Mounted Duct Type

Model			FXMQ30MVJU	FXMQ36MVJU	FXMQ48MVJU
★1 Cooling Capacity		Btu/h	30,000	36,000	48,000
★2 Heating Capacity		Btu/h	34,000	40,000	54,000
Casing / Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in	15-3/8×28-3/8×27-1/8	15-3/8×43-3/4×27-1/8	15-3/8×43-3/4×27-1/8
Coil (Cross Fin Coil)	Rows×Stages×FPI		3×16×13	3×16×13	3×16×13
	Face Area	ft²	1.95	3.43	3.43
Fan	Model		D11/2D3AA1VE	2D11/2D3AG1VE	2D11/2D3AF1VE
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.21	0.36	0.58
	Air Flow Rate (H/L)	cfm	690/565	1,020/810	1,270/1,020
	External Static Pressure ★4	in. Aq	0.66-0.43	0.71-0.43	1.0-0.72
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber	Glass Fiber	Glass Fiber
Air Filter			★5	★5	★5
Piping Connections	Liquid Pipes	in	ϕ3/8 (Flare Connection)	ϕ3/8 (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in	ϕ5/8 (Flare Connection)	ϕ5/8 (Flare Connection)	ϕ5/8 (Flare Connection)
	Drain Pipe	in	VP25 (External Dia. 1-1/4) Internal Dia. 1	VP25 (External Dia. 1-1/4) Internal Dia. 1	VP25 (External Dia. 1-1/4) Internal Dia. 1
Machine Weight (Mass)		Lbs	99	139	144
★6 Sound Level (H/L)		dBA	45/41	45/41	48/45
Safety Devices			Fuse, Thermal Fuse for Fan Motor	Fuse, Thermal Fuse for Fan Motor	Fuse, Thermal Fuse for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.	Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.	Operation Manual, Installation Manual, Drain Hose, Clamp Metal, Insulation for Fitting, Sealing Pads, Clamps, Screws.
Drawing No.			C:3D042685		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 External static pressure is changeable to change over the connectors inside electrical box, this pressure means " High static pressure – Standard ".

★5 Air filter is not standard accessory, but please mount it in the duct system of the suction side.
Select its colorimetric method (gravity method) 50% or more.

★6 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Ceiling Suspended Type

Model			FXHQ12MVJU	FXHQ24MVJU	FXHQ36MVJU
★1 Cooling Capacity		Btu/h	12,000	24,000	36,000
★2 Heating Capacity		Btu/h	13,500	27,000	40,000
Casing Color			White (10Y9/0.5)	White (10Y9/0.5)	White (10Y9/0.5)
Dimensions: (H×W×D)		in	7-11/16×37-13/16×26-3/4	7-11/16×55-1/8×26-3/4	7-11/16×62-5/8×26-3/4
Coil (Cross Fin Coil)	Rows×Stages×FPI		2×12×15	3×12×15	2×12×15+2×10×15
	Face Area	ft²	1.96	3.15	3.66+2.95
Fan	Model		3D12K1AA1	3D12K2AA1	————————
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	W	62	130	130
	Air Flow Rate (H/L)	CFM	410/340	710/600	830/670
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Wool	Glass Wool	Glass Wool
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	in	ϕ1/4 (Flare Connection)	ϕ3/8 (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in	ϕ1/2 (Flare Connection)	ϕ5/8 (Flare Connection)	ϕ5/8 (Flare Connection)
	Drain Pipe	in	VP20 (External Dia. 1, Internal Dia. 3/4)	VP20 (External Dia. 1, Internal Dia. 3/4)	VP20 (External Dia. 1, Internal Dia. 3/4)
Machine Weight (Mass)		Lbs	55	80	90
★4 Sound Level (H)		dBA	42	44	46
Safety Devices			Fuse Thermal Protector for Fan Motor	Fuse Thermal Protector for Fan Motor	Fuse Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable Outdoor Unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Drain Hose, Paper Pattern for Installation, Clamp Metal, Insulation for Fitting, Clamps, Washers.	Operation Manual, Installation Manual, Drain Hose, Paper Pattern for Installation, Clamp Metal, Insulation for Fitting, Clamps, Washers.	Operation Manual, Installation Manual, Drain Hose, Paper Pattern for Installation, Clamp Metal, Insulation for Fitting, Clamps, Washers.
Drawing No.			C:4D049326		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
Outdoor temperature: 95°FDB
Equivalent ref. piping: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of ambient conditions.

Wall Mounted Type

Model			FXAQ07MVJU	FXAQ09MVJU	FXAQ12MVJU
★1 Cooling Capacity		Btu/h	7,500	9,500	12,000
★2 Heating Capacity		Btu/h	8,500	10,500	13,500
Casing Color			White (3.0Y8.5/0.5)	White (3.0Y8.5/0.5)	White (3.0Y8.5/0.5)
Dimensions: (H×W×D)		in	11–3/8×31–1/4×9	11–3/8×31–1/4×9	11–3/8×31–1/4×9
Coil (Cross Fin Coil)	Rows×Stages×FPI		2×14×17	2×14×17	2×14×17
	Face Area	ft²	1.73	1.73	1.73
Fan	Model		QCL9661M	QCL9661M	QCL9661M
	Type		Cross Flow Fan	Cross Flow Fan	Cross Flow Fan
	Motor Output	HP	0.054	0.054	0.054
	Air Flow Rate (H/L)	cfm	260/160	280/175	300/180
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene
Air Filter			Resin Net (Washable)	Resin Net (Washable)	Resin Net (Washable)
Piping Connections	Liquid Pipes	in	ϕ1/4 (Flare Connection)	ϕ1/4 (Flare Connection)	ϕ1/4 (Flare Connection)
	Gas Pipes	in	ϕ1/2 (Flare Connection)	ϕ1/2 (Flare Connection)	ϕ1/2 (Flare Connection)
	Drain Pipe	in	VP13 (External Dia. 11/16 Internal Dia. 1/2)	VP13 (External Dia. 11/16 Internal Dia. 1/2)	VP13 (External Dia. 11/16 Internal Dia. 1/2)
Machine Weight (Mass)		Lbs	25	25	25
★4 Sound Level (H)		dBA	36	37	38
Safety Devices			Fuse	Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tube, Clamps, Screws.	Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tube, Clamps, Screws.	Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tube, Clamps, Screws.
Drawing No.			C:3D046038A		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Wall Mounted Type

Model			FXAQ18MVJU	FXAQ24MVJU
★1 Cooling Capacity		Btu/h	18,000	24,000
★2 Heating Capacity		Btu/h	20,000	27,000
Casing Color			White (3.0Y8.5/0.5)	White (3.0Y8.5/0.5)
Dimensions: (H×W×D)		in	11–3/8×41–3/8×9	11–3/8×41–3/8×9
Coil (Cross Fin Coil)	Rows×Stages×FPI		2×14×17	2×14×17
	Face Area	ft²	2.29	2.29
Fan	Model		QCL9686	QCL9686
	Type		Cross Flow Fan	Cross Flow Fan
	Motor Output	HP	0.058	0.058
	Air Flow Rate (H/L)	cfm	500/400	635/470
	Drive		Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Foamed Polystyrene / Foamed Polyethylene	Foamed Polystyrene / Foamed Polyethylene
Air Filter			Resin Net (Washable)	Resin Net (Washable)
Piping Connections	Liquid Pipes	in	ϕ1/4 (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in	ϕ1/2 (Flare Connection)	ϕ5/8 (Flare Connection)
	Drain Pipe	in	VP13 (External Dia. 11/16 Internal Dia. 1/2)	VP13 (External Dia. 11/16 Internal Dia. 1/2)
Machine Weight (Mass)		Lbs	31	31
★4 Sound Level (H)		dBA	43	47
Safety Devices			Fuse	Fuse
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve
Connectable outdoor unit			R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tube, Clamps, Screws.	Operation Manual, Installation Manual, Installation Panel, Paper Pattern for Installation, Insulation Tube, Clamps, Screws.
Drawing No.			C:3D046038A	

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Floor Standing Type

Model			FXLQ12MVJU	FXLQ18MVJU	FXLQ24MVJU
★1 Cooling Capacity		Btu/h	12,000	18,000	24,000
★2 Heating Capacity		Btu/h	13,500	20,000	27,000
Casing Color			Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)	Ivory White (5Y7.5/1)
Dimensions: (H×W×D)		in	23–5/8×44–7/8×8–3/4	23–5/8×55–7/8×8–3/4	23–5/8×55–7/8×8–3/4
Coil (Cross Fin Coil)	Rows×Stages×FPI		3×14×17	3×14×17	3×14×17
	Face Area	ft²	2.15	3.04	3.04
Fan	Model		2D14B13	2D14B20	2D14B20
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.034	0.047	0.047
	Air Flow Rate (H/L)	cfm	280/210	490/380	560/420
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber / Urethane Foam	Glass Fiber / Urethane Foam	Glass Fiber / Urethane Foam
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	in	ϕ1/4 (Flare Connection)	ϕ1/4 (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in	ϕ1/2 (Flare Connection)	ϕ1/2 (Flare Connection)	ϕ5/8 (Flare Connection)
	Drain Pipe	in	ϕ27/32 O.D (Vinyl Chloride)	ϕ27/32 O.D (Vinyl Chloride)	ϕ27/32 O.D (Vinyl Chloride)
Machine Weight (Mass)		Lbs	66	80	80
★4 Sound Level (H)		dBA	36	40	41
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable Outdoor Unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.
Drawing No.			C:3D045640		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Concealed Floor Standing Type

Model			FXNQ12MVJU	FXNQ18MVJU	FXNQ24MVJU
★1 Cooling Capacity		Btu/h	12,000	18,000	24,000
★2 Heating Capacity		Btu/h	13,500	20,000	27,000
Casing Color			Galvanized Steel Plate	Galvanized Steel Plate	Galvanized Steel Plate
Dimensions: (H×W×D)		in	24×42–1/8×8–5/8	24×53–1/8×8–5/8	24×53–1/8×8–5/8
Coil (Cross Fin Coil)	Rows×Stages×FPI		3×14×17	3×14×17	3×14×17
	Face Area	ft²	2.15	3.04	3.04
Fan	Model		2D14B13	2D14B20	2D14B20
	Type		Sirocco Fan	Sirocco Fan	Sirocco Fan
	Motor Output	HP	0.034	0.047	0.047
	Air Flow Rate (H/L)	cfm	280/210	490/380	560/420
	Drive		Direct Drive	Direct Drive	Direct Drive
Temperature Control			Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating	Microprocessor Thermostat for Cooling and Heating
Sound Absorbing Thermal Insulation Material			Glass Fiber / Urethane Foam	Glass Fiber / Urethane Foam	Glass Fiber / Urethane Foam
Air Filter			Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)	Resin Net (with Mold Resistant)
Piping Connections	Liquid Pipes	in	ϕ1/4 (Flare Connection)	ϕ1/4 (Flare Connection)	ϕ3/8 (Flare Connection)
	Gas Pipes	in	ϕ1/2 (Flare Connection)	ϕ1/2 (Flare Connection)	ϕ5/8 (Flare Connection)
	Drain Pipe	in	ϕ27/32 O.D (Vinyl Chloride)	ϕ27/32 O.D (Vinyl Chloride)	ϕ27/32 O.D (Vinyl Chloride)
Machine Weight (Mass)		Lbs	66	80	80
★4 Sound Level (H)		dBA	36	40	41
Safety Devices			Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor	Fuse, Thermal Protector for Fan Motor
Refrigerant Control			Electronic Expansion Valve	Electronic Expansion Valve	Electronic Expansion Valve
Connectable Outdoor Unit			R-410A Series	R-410A Series	R-410A Series
Standard Accessories			Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.	Operation Manual, Installation Manual, Insulation for Fitting, Drain Hose, Clamps, Screws, Washers, Level Adjustment Screw.
Drawing No.			3D045640		

Notes:

★1 Nominal cooling capacities are based on the following conditions:
Return air temperature: 80°FDB, 67°FWB
Outdoor temperature: 95°FDB
Equivalent ref. piping length: 25ft (Horizontal)

★2 Nominal heating capacities are based on the following conditions:
Return air temperature: 70°FDB.
Outdoor temperature: 47°FDB, 43°FWB
Equivalent ref. piping length: 25ft (Horizontal)

3 Capacities are net, including a deduction for cooling (an addition for heating) for indoor fan motor heat.

★4 Anechoic chamber conversion value, measured under JISB8616 conditions. During actual operation, these values are normally somewhat higher as a result of installation conditions.

Part 3
Refrigerant Circuit

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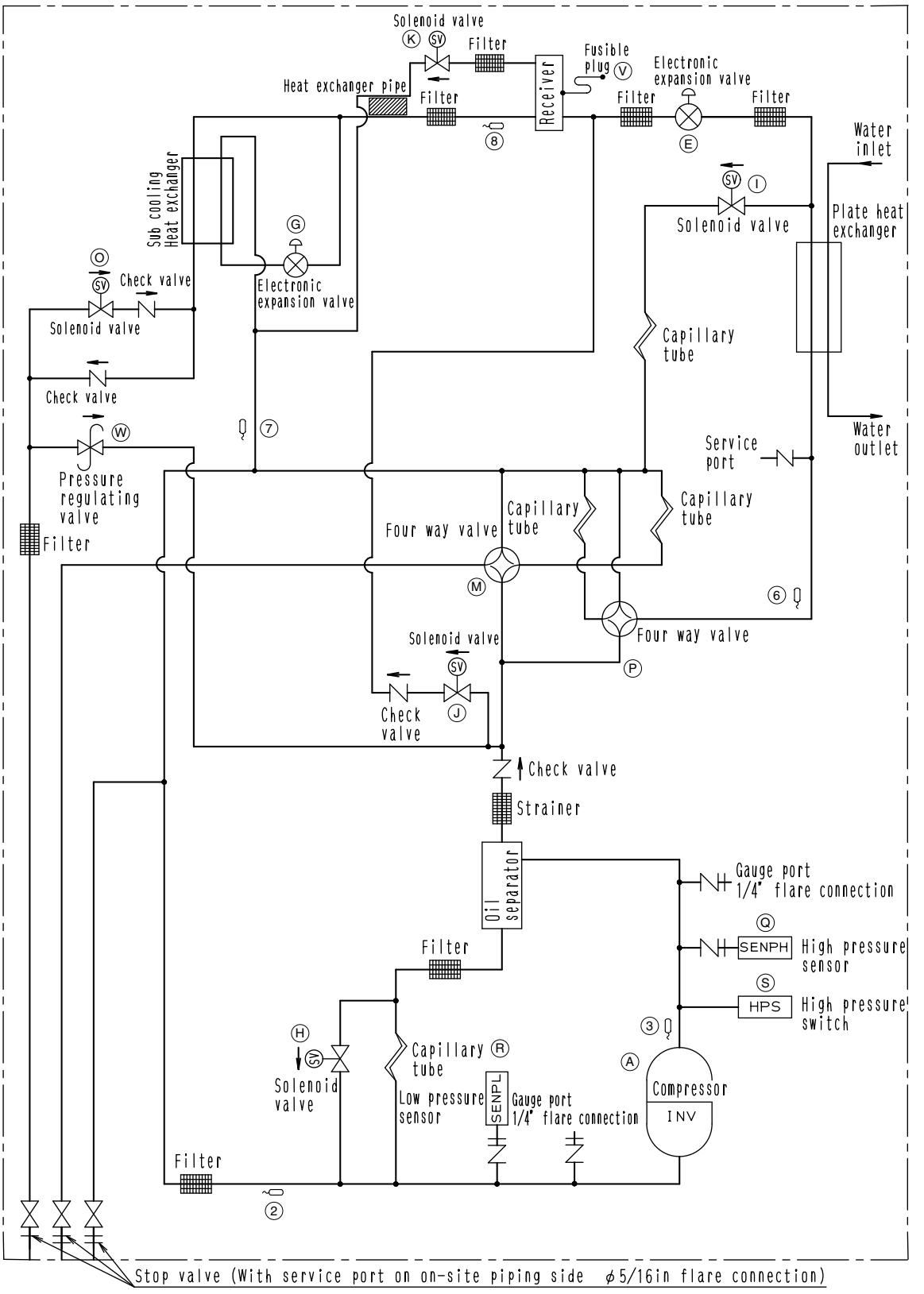
1. Refrigerant Circuit

1.1 RWEYQ60MTJU / RWEYQ72MTJU / RWEYQ84MTJU

No. in refrigerant system diagram	Symbol	Name	Major Function
A	M1C	Inverter compressor (INV)	Inverter compressor is operated on frequencies between 52 Hz and 230 Hz by using the inverter. The number of operating steps is as follows.
E	Y1E	Electronic expansion valve (Main: EV1)	In cooling operation: High pressure control In heating or simultaneous cooling/heating operation: When the heat exchanger is used as the evaporator : SH control When the heat exchanger is used as the condenser : High pressure control
G	Y3E	Electronic expansion valve (Subcool: EV3)	PI control is applied to keep the outlet superheated degree of sub-cooling heat exchanger constant.
H	Y1S	Solenoid valve (Hot gas: SVP)	Used to prevent the low pressure from transient falling.
I	Y2S	Solenoid valve (Oil return of water heat exchanger: SVE)	Used to collect the refrigerant oil from water heat exchanger.
J	Y3S	Solenoid valve (Receiver gas charging: SVL)	Used to maintain high pressure while in cooling operation at low water temperature. And also used to prevent the accumulation of refrigerant in non-operating outside units in the case of multiple-outside-unit system.
K	Y4S	Solenoid valve (Receiver gas discharging: SVG)	Used to collect refrigerant to receiver.
M	Y5S	4-way selector valve (Main: 20S1)	Changes the operation into cooling, heating or simultaneous cooling/heating operation.
O	Y6S	Solenoid valve (Non-operating unit liquid pipe closing: SVSL)	Used to prevent the accumulation of refrigerant in non-operating outside units in the case of multiple-outside-unit system.
P	Y7S	4-way selector valve (Sub: 20S2)	Changes the water heat exchanger into condenser or evaporator.
Q	S1NPH	High pressure sensor	Used to detect high pressure.
R	S2NPL	Low pressure sensor	Used to detect low pressure.
S	S1PH	HP pressure switch (For INV compressor)	In order to prevent the increase of high pressure when a malfunction occurs, this switch is activated at high pressure of 580psi or more to stop the compressor operation.
V	–	Fusible plug	In order to prevent the increase of pressure when abnormal heating is caused by fire or others, the fusible part of the plug is molten at a temperature of 158 to 167°F to release the pressure into the atmosphere.
W	–	Pressure regulating valve 1 (Liquid pipe to discharge pipe)	This valve opens at a pressure of 580psi or more for prevention of pressure increase, thus resulting in no damage of functional parts due to the increase of pressure in transportation or storage.
2	R2T	Thermistor (Suction pipe: Ts)	Used to detect suction pipe temperature, keep the suction superheated degree constant in heating operation, and others.
3	R3T	Thermistor (INV discharge pipe: Tdi)	Used to detect discharge pipe temperature, make the temperature protection control of compressor, and others.
6	R4T	Thermistor (Heat exchanger gas pipe: Tg)	Used to detect gas pipe temperature of water heat exchanger.
7	R5T	Thermistor (Sub-cooling heat exchanger outlet pipe: Tsh)	Used to detect gas pipe temperature on the evaporation side of sub-cooling heat exchanger, keep the superheated degree at the outlet of sub-cooling heat exchanger constant, and others.
8	R6T	Thermistor (Receiver outlet liquid pipe: Tl)	Used to detect receiver outlet liquid pipe temperature, prevent the drift between outdoor units while in heating operation in the case of multiple-outside-unit system, and others.

RWEYQ60MTJU / RWEYQ72MTJU / RWEYQ84MTJU



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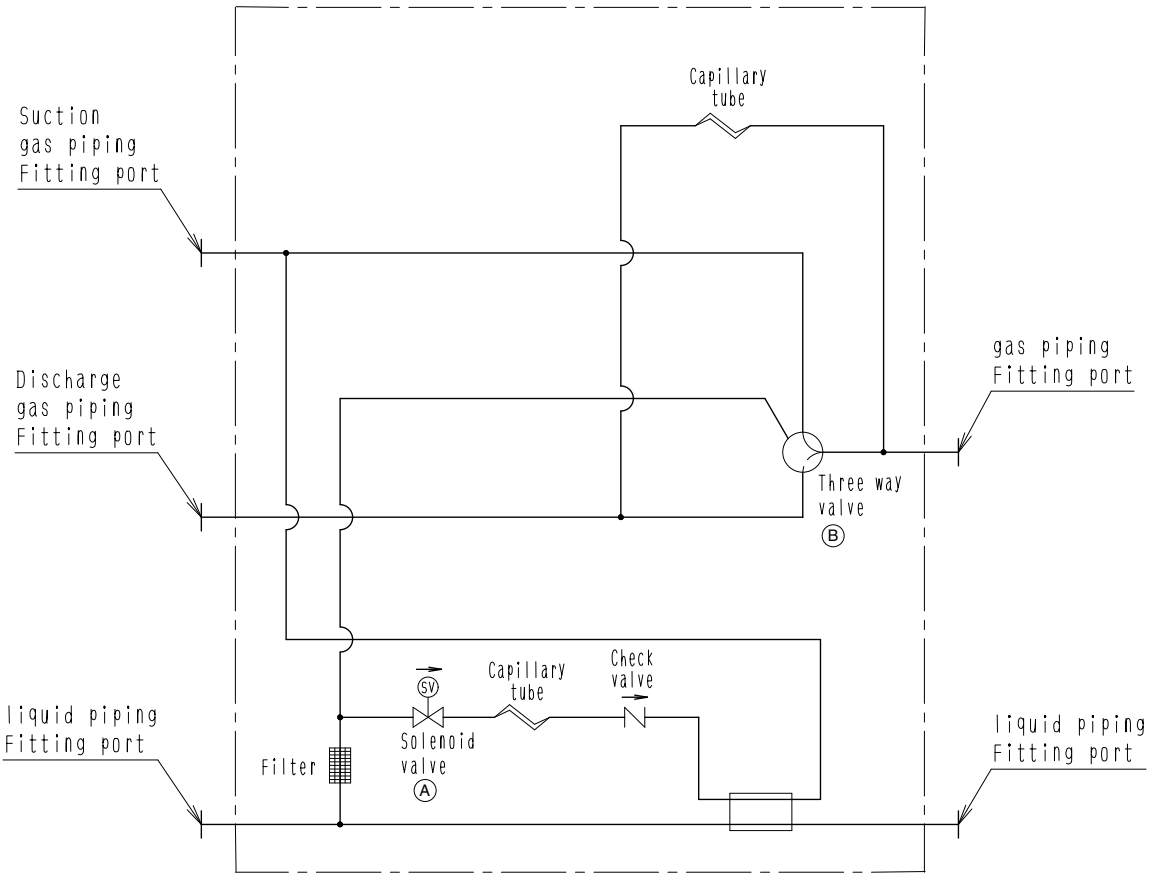
1.2 BSVQ36, 60M

No.	Symbol	Name	Major function
A	Y1S	Solenoid valve (20RT)	(For liquid pipe) Super-cools liquid refrigerant in the heating operation unit during cooling/heating simultaneous operation, in order to prevent capacity reducing in cooling operation unit caused by flash gas generated in the liquid pipe
B	Y3S	Solenoid valve (20RH)	Used to changeover the cooling and heating operation of indoor units



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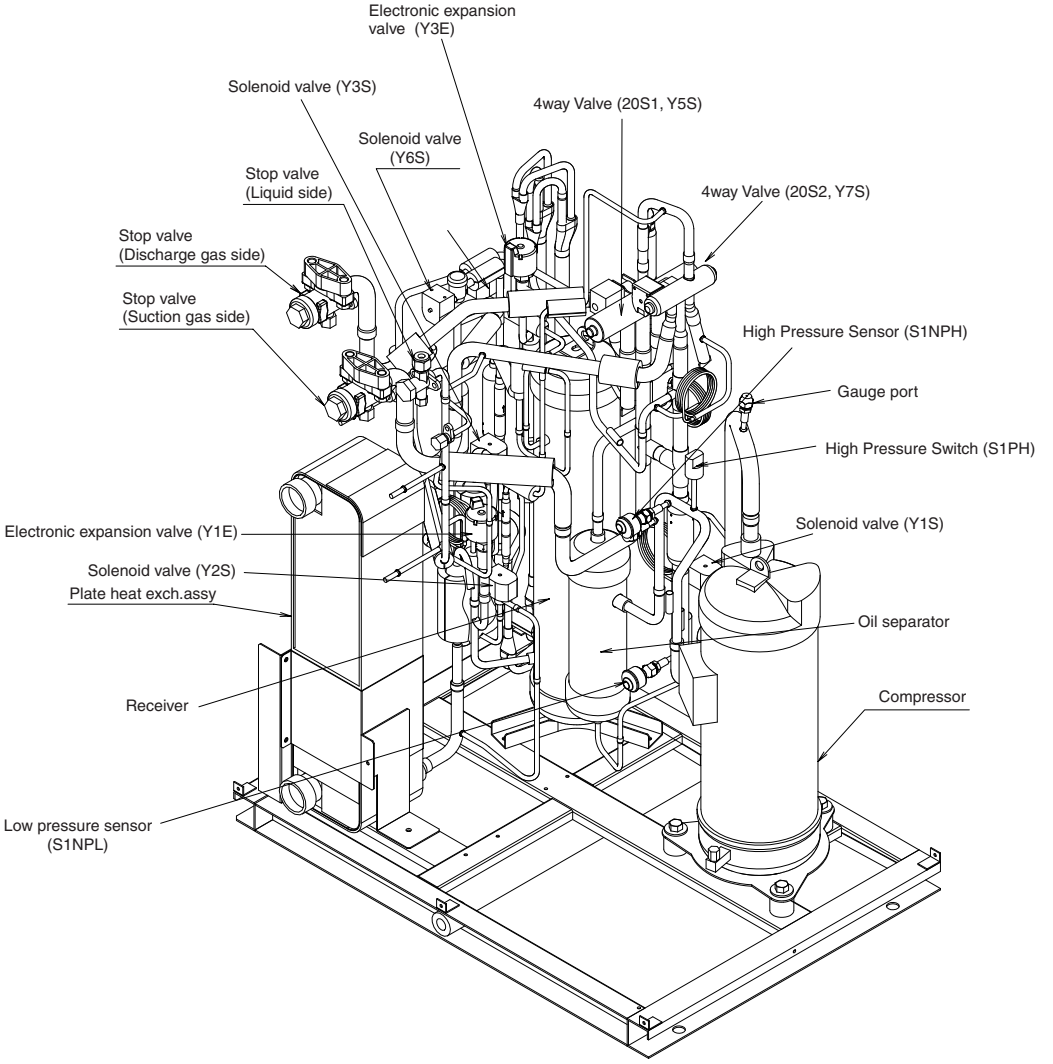
2. Functional Parts Layout

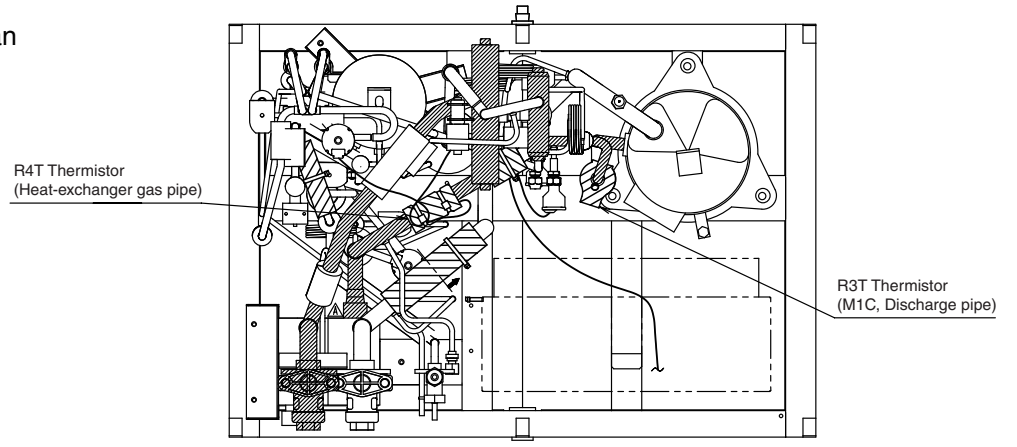
2.1 RWEYQ60MTJU / RWEYQ72MTJU / RWEYQ84MTJU

2.1.1 Functional Parts Layout (Solenoid Valve etc.)

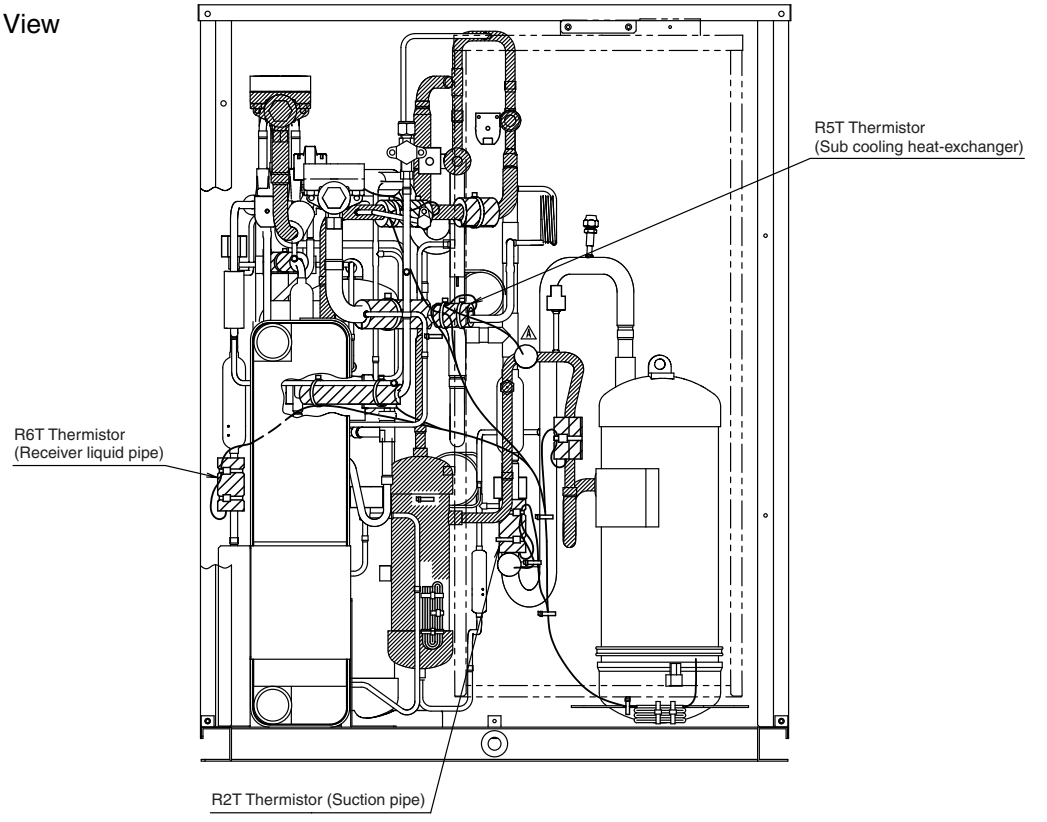


2.1.2 Sensors

Plan



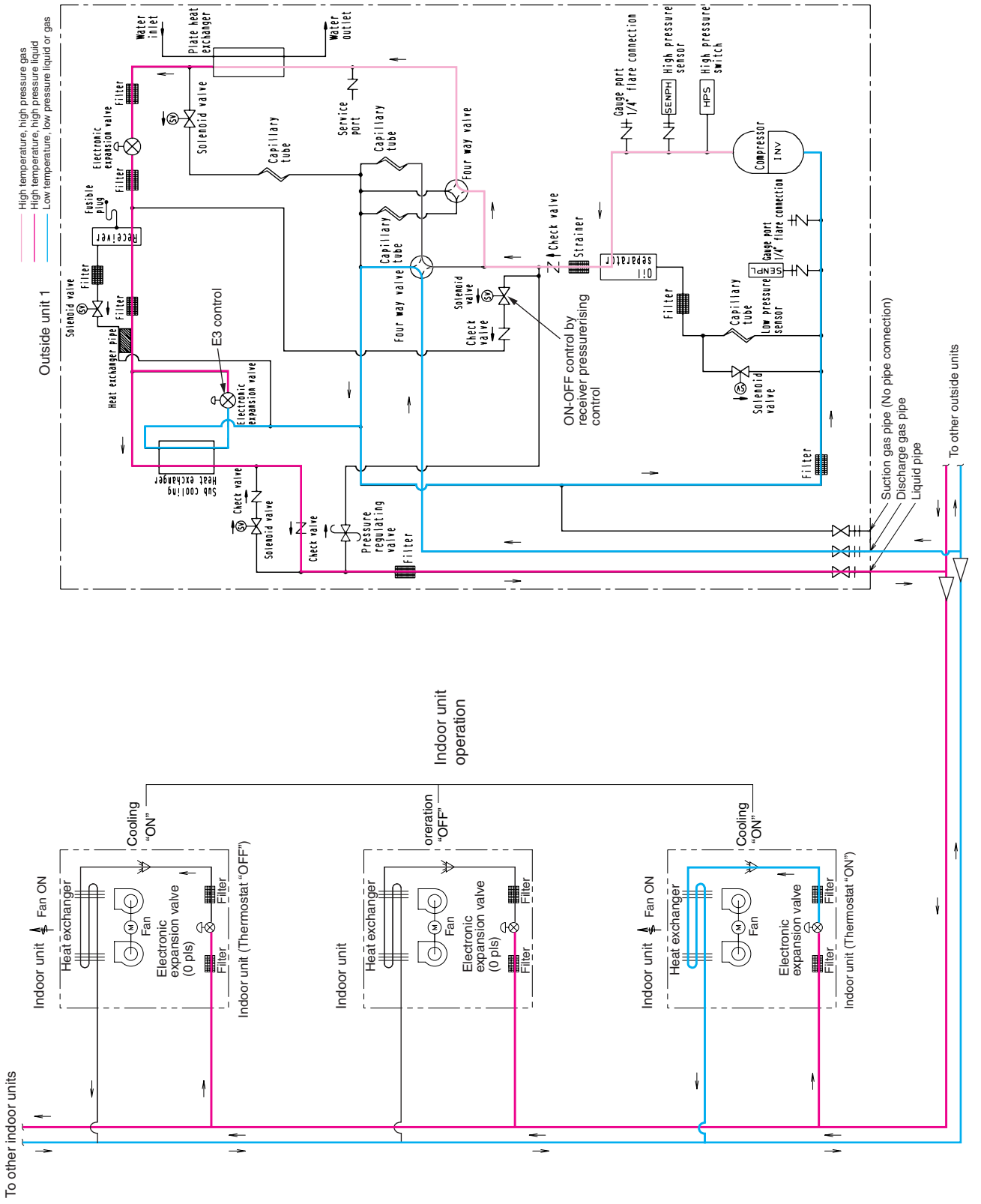
Front View



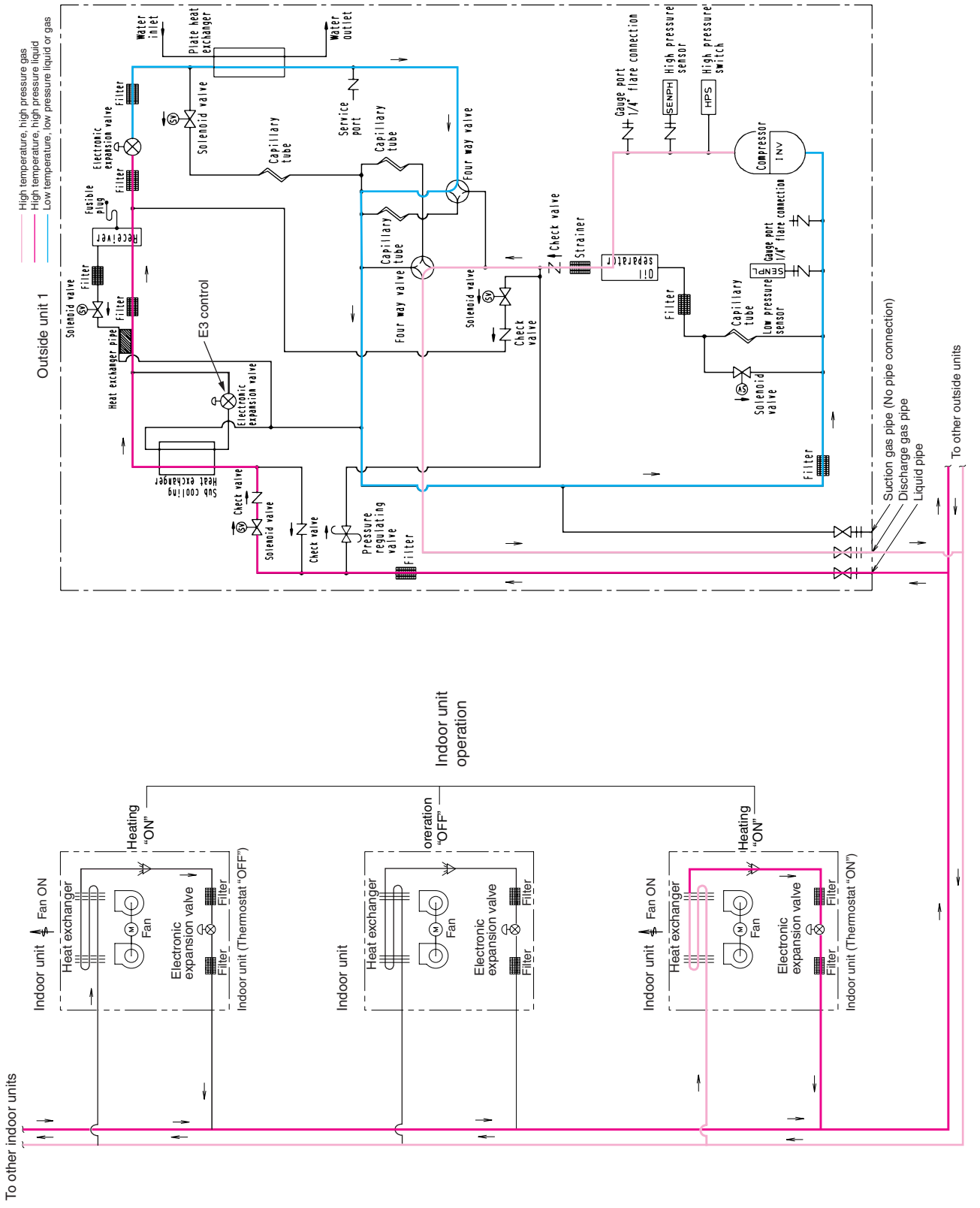
3. Refrigerant Flow for Each Operation Mode

3.1 In Case of Heat Pump Connection

A. Cooling Operation

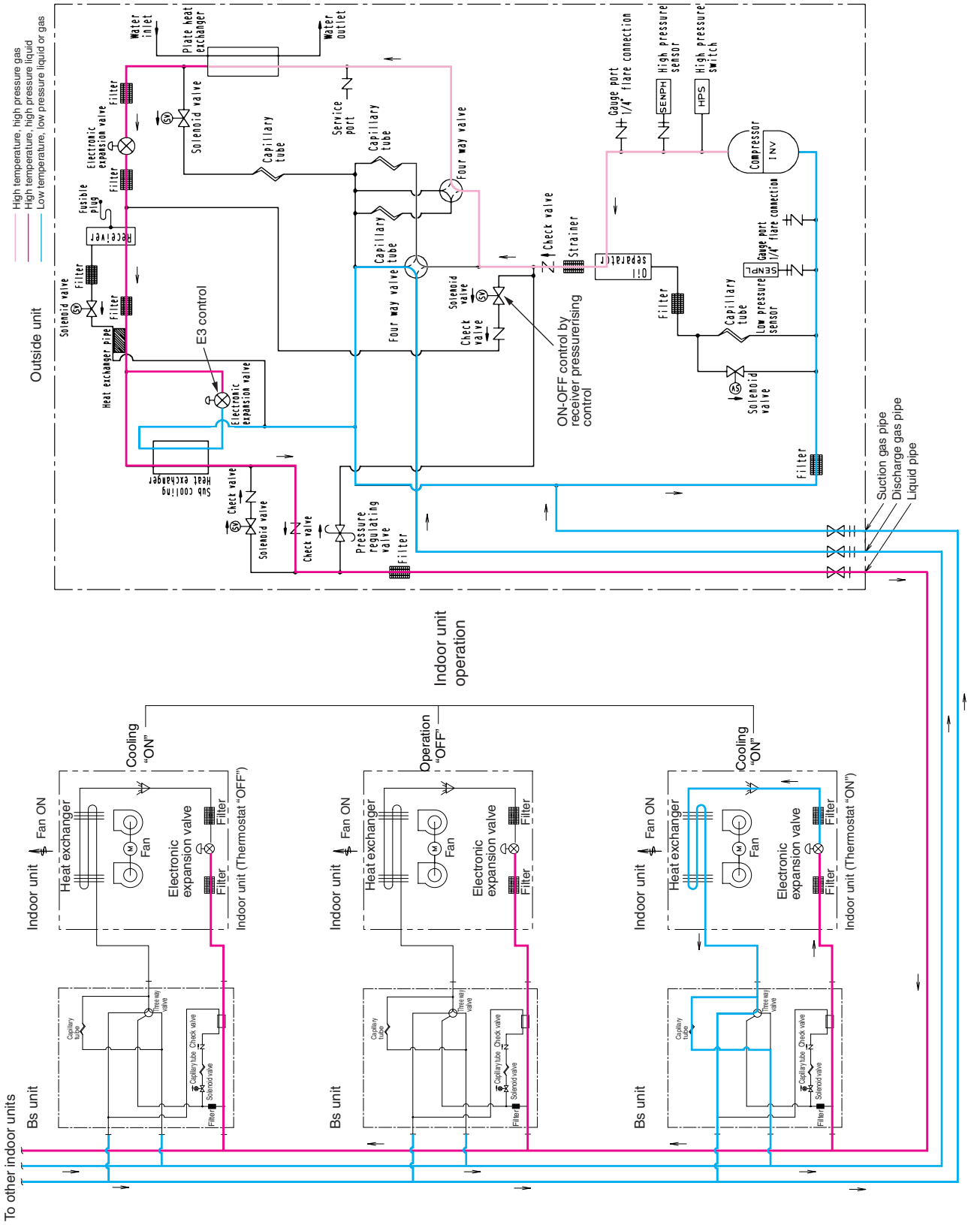


B. Heating Operation

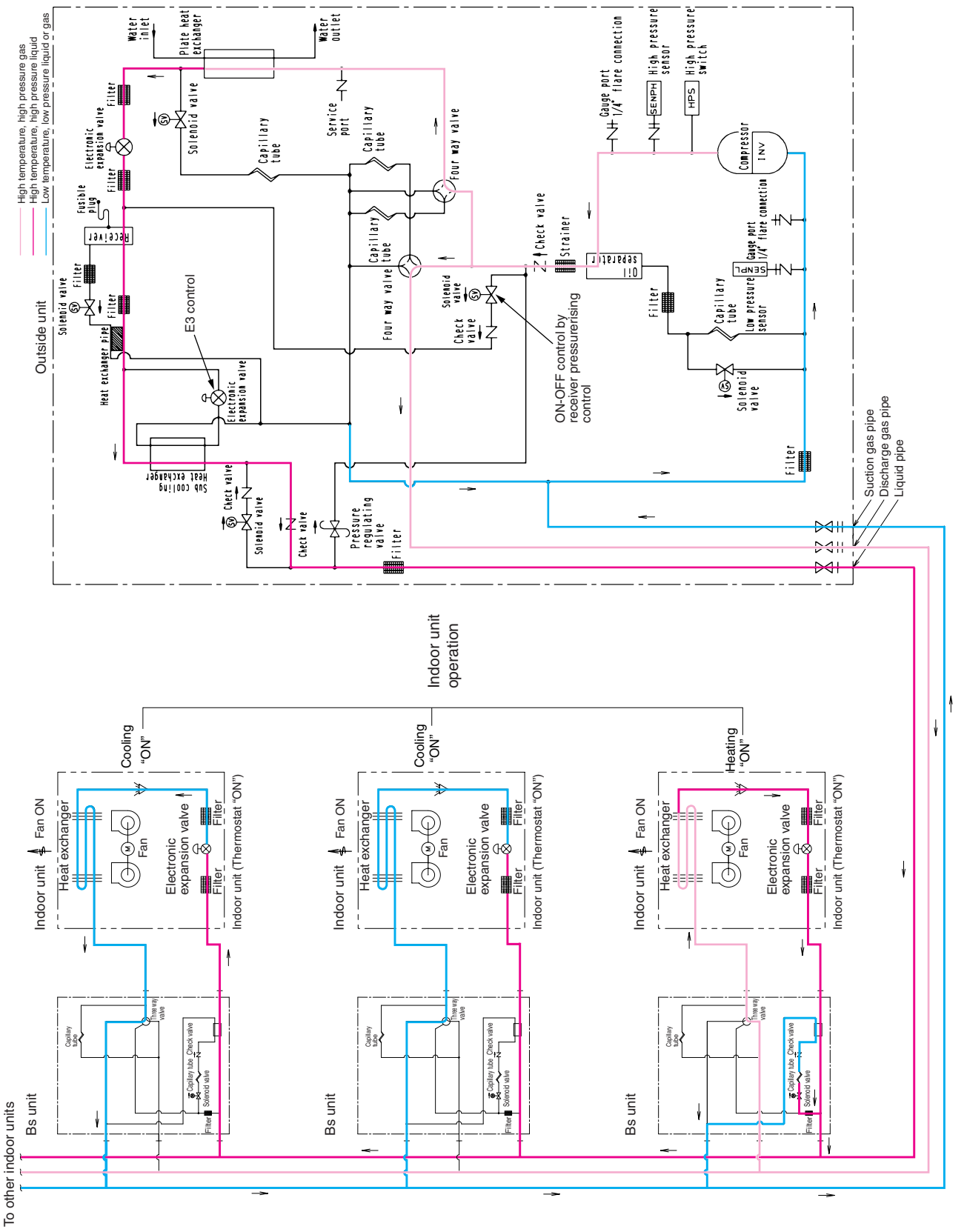


3.2 In Case of Heat Recovery Connection (One Outside Unit Installation)

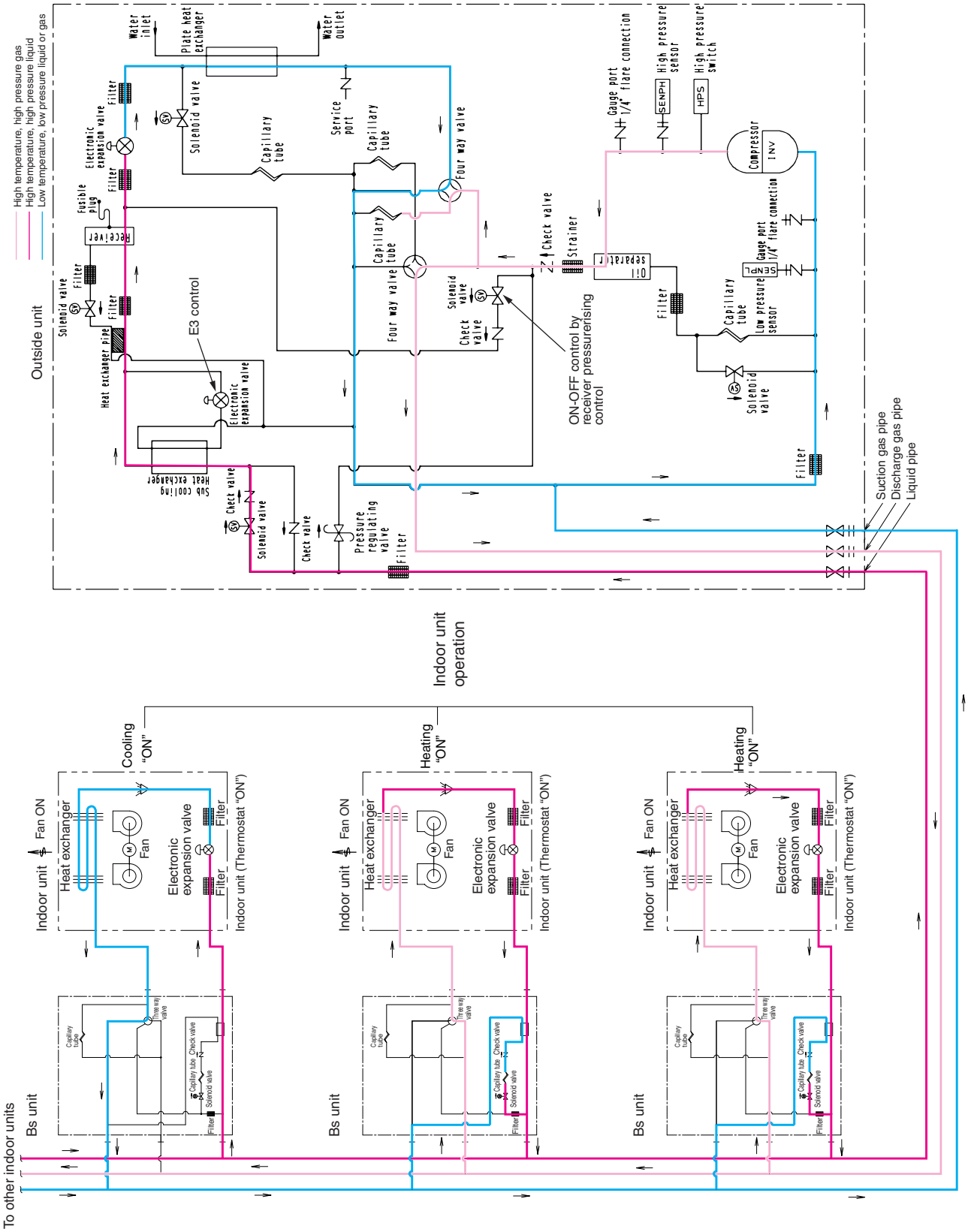
A. Cooling Operation



B. Heating and simultaneous cooling/heating operation (When the outdoor water cooled heat exchanger is used as condenser.)

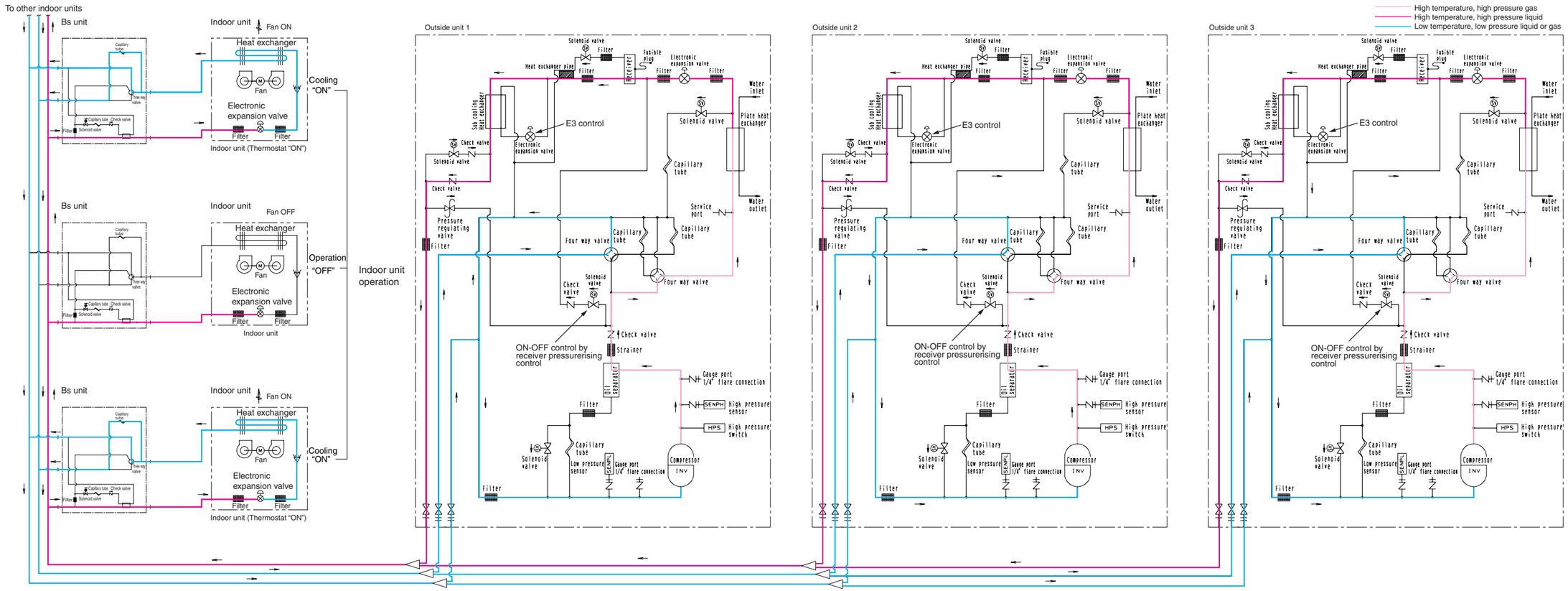


C. Heating and simultaneous cooling heating operation mode (When the outdoor water cooled heat exchanger is used as evaporator.)
(In case there are indoor units operating with cooling thermostat “ON”.)

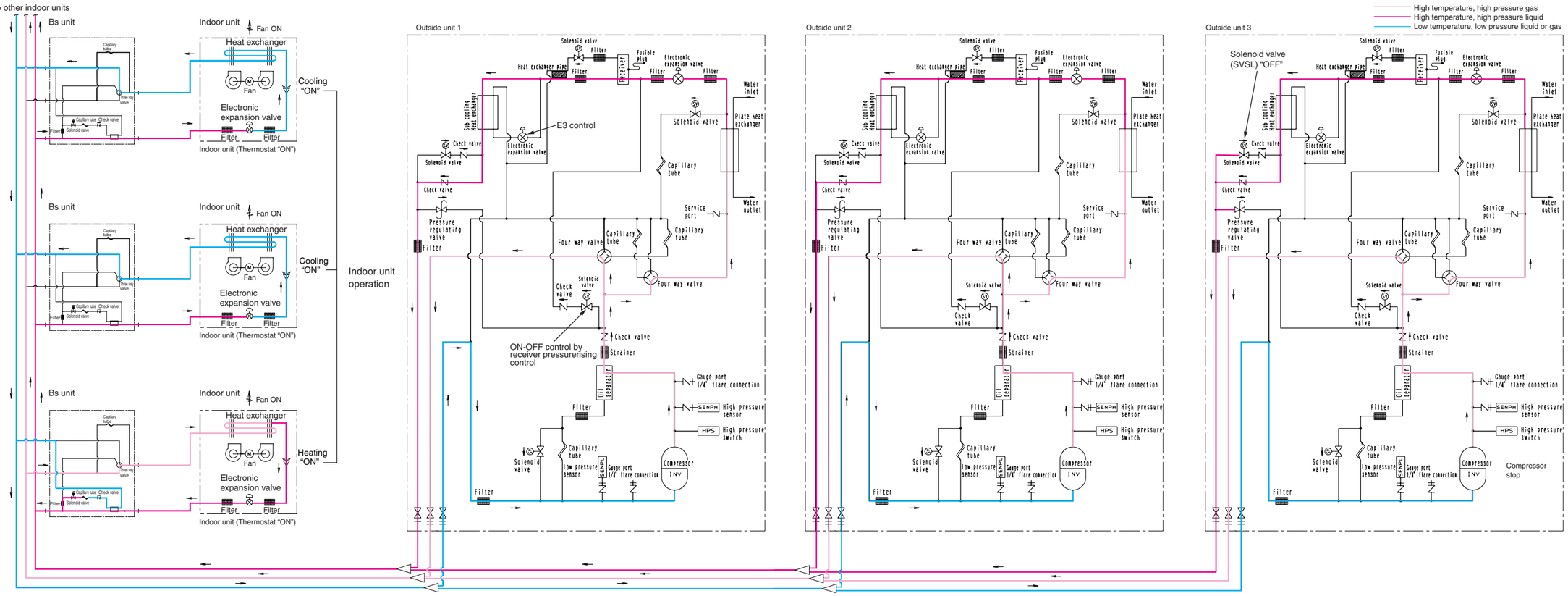


3.3 In Case of Heat Recovery Connection (3 Outside units Connection.)

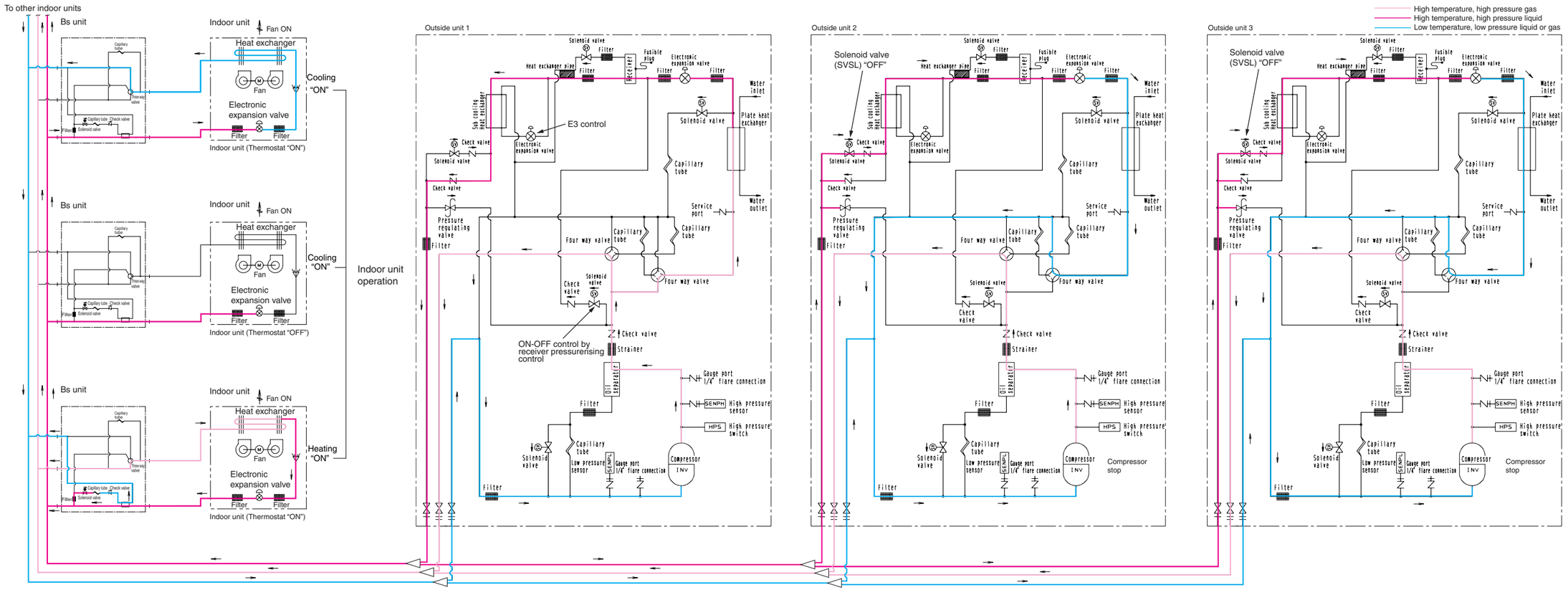
A. Cooling Operation



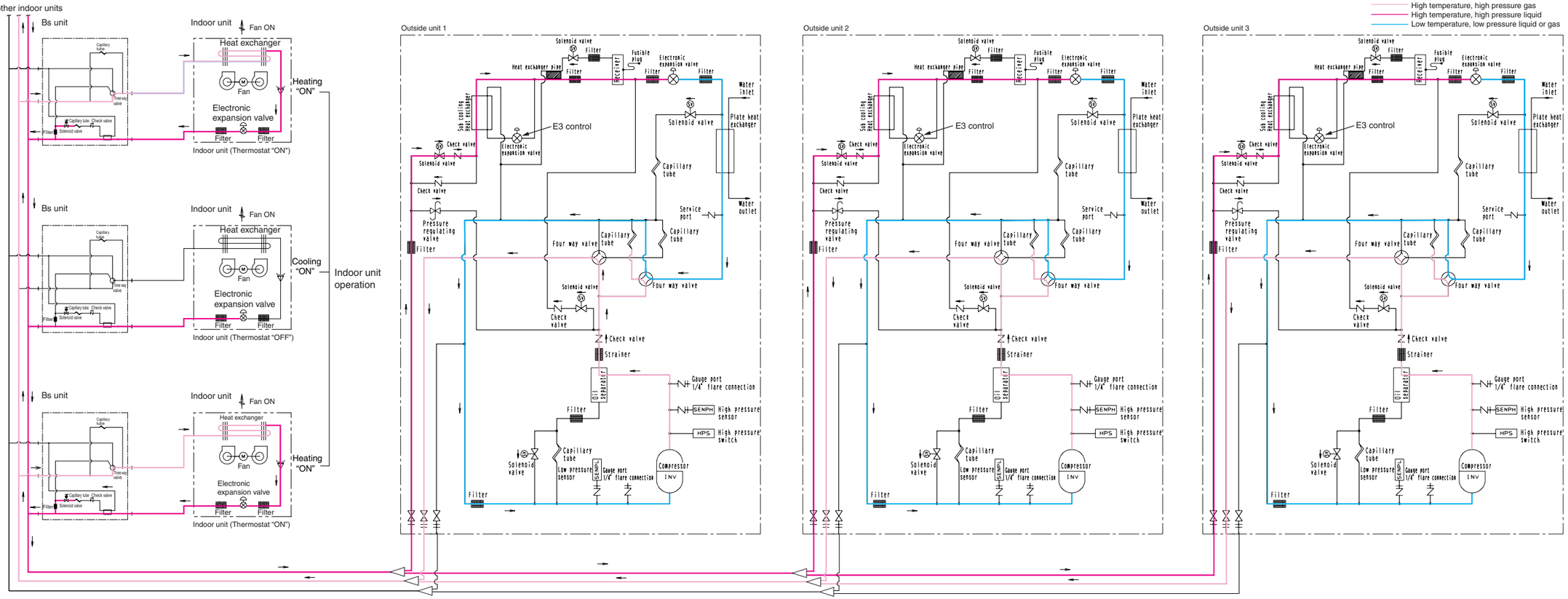
B: Heating and simultaneous cooling/heating operation mode (When the outdoor water cooled heat exchangers are used only as condenser.)



C: Heating and simultaneous cooling/heating operation mode (When the outdoor water cooled heat exchangers are used as condenser and evaporator mixed.)



D: Heating and simultaneous cooling/heating operation mode (When the outdoor water cooled heat exchangers are used only as evaporator.)



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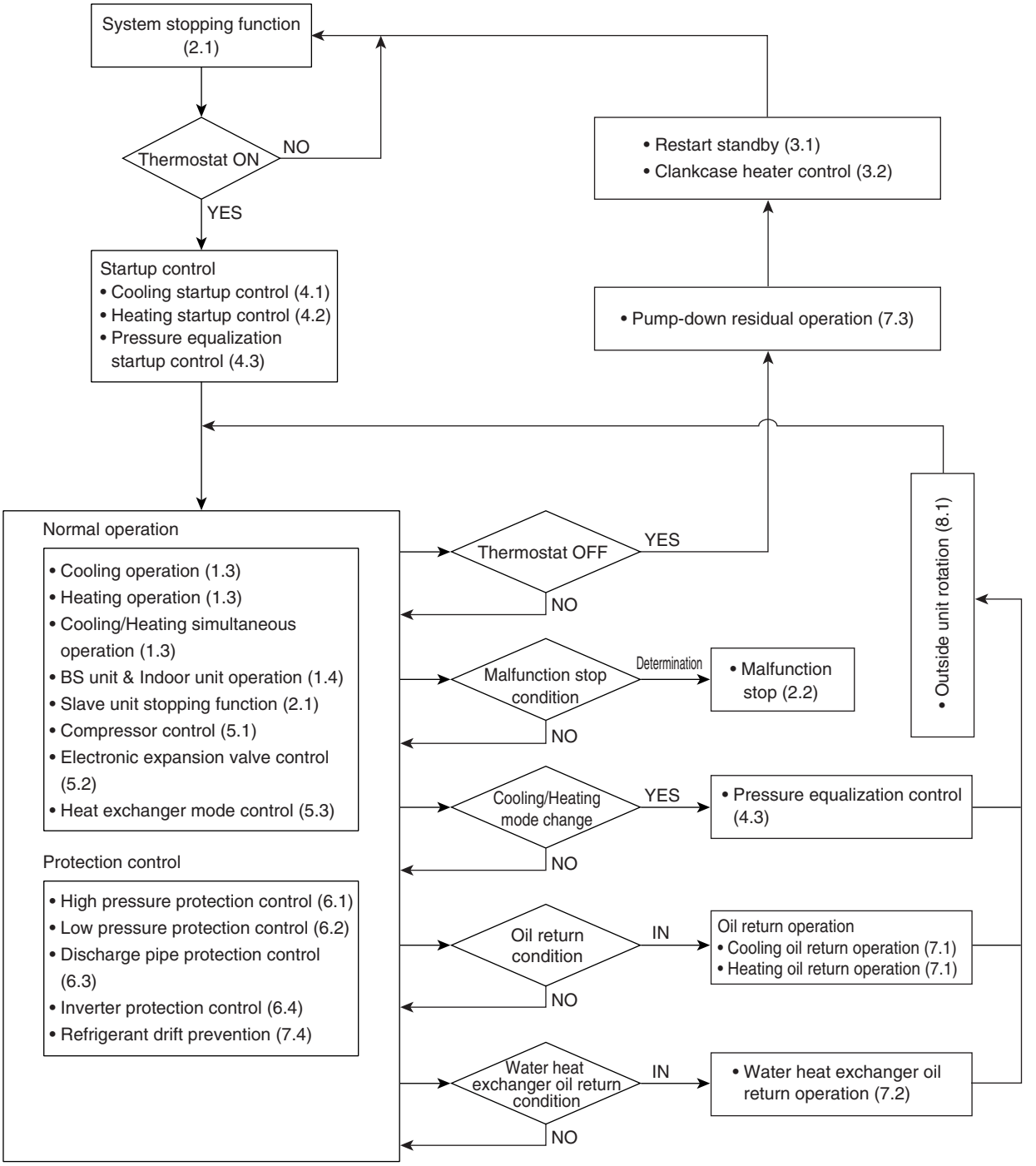
1. Function General

1.1 Symbol

Symbol	Electric symbol	Description or function
20S1	Y5S	Four way valve (Main)
20S2	Y7S	Four way valve (For heat exchanger)
DSH	—	Discharge pipe superheat
DSHi	—	Discharge pipe superheat of inverter compressor
EV	(Y1E, Y3E)	Opening of electronic expansion valve
EV1	Y1E	Electronic expansion valve for water heat exchanger
EV3	Y3E	Electronic expansion valve for sub-coolig heat exchanger
HTDi	—	Value of INV compressor discharge pie temperature (R3T) compensated with outdoor air temperature
Pc	S1NPH	Value detected by high pressure sensor
Pe	S1NPL	Value detected by low pressure sensor
SH	—	Evaporator outlet superheat
SHS	—	Target evaporator outlet superheat
SVG	Y4S	Solenoid valve for discharging gas from receiver
SVL	Y3S	Solenoid valve for gas charging to receiver
SVE	Y2S	Solenoid valve for oil collection from water heat exchanger
SVP	Y1S	Solenoid valve for hot gas bypass
SVSL	Y6S	Solenoid valve for non-operating unit liquid pipe closing
Tc	—	High pressure equivalent saturation temperature
TcS	—	Target temperature of Tc (Condensing temperature)
Te	—	Low pressure equivalent saturation temperature
TeS	—	Target temperature of Te (Evaporating temperature)
Tfin	R1T	Inverter fin temperature
Ts	R2T	Suction pipe temperature detected by R2T (Suction pipe)
Tsh	R5T	Temperature detected by R5T-gas pipe temperature of sub-cooling heat exchanger gas side (outlet temperature)
Tp	—	Calculated value of compressor port temperature
Tdi	R3T	Discharge temperature detected by thermistor located the inverter compressor discharge pipe
Tl	R6T	Liquid pipe temperature
Tg	R4T	The gas pipe temperature of water heat exchanger

1.2 Operation Mode



* Figures in the parentheses indicate the description Nos. of functional operation shown in the following pages.

1.3 Normal Operation

Parts name	Symbol	Electrical symbol	Actuator function	
			Normal cooling	Normal heating or normal cooling/ heating simultaneous operation
Compressor	—	(M1C)	PI control, High pressure protection, Low pressure protection, Discharge pipe temperature protection control, Inverter protection control	PI control, High pressure protection, Low pressure protection, Discharge pipe temperature protection control, Inverter protection control
Inverter cooling fan	—	(M1, 2F)	Inverter cooling fan control	Inverter cooling fan control
4 way valve (Main)	20S1	(Y5S)	OFF	ON
4 way valve (for heat exchanger)	20S2	(Y7S)	OFF	Heat exchanger mode control (In case of heating and simultaneous cooling/heating operation)
Main heat exchanger electronic exp. valve	EV1	(Y1E)	Heat exchanger mode control (In case of cooling operation)	Heat exchanger mode control (In case of heating and simultaneous cooling/heating operation)
Sub-cooling electronic exp. valve	EV3	(Y3E)	EV3 control	EV3 control
Hot gas bypass solenoid valve	SVP	(Y1S)	Protection control	Protection control
Water heat exchanger oil return solenoid valve	SVE	(Y2S)	OFF	Water heat exchanger oil return control
Receiver gas charging solenoid valve	SVL	(Y3S)	Receiver pressurising control	Receiver pressurising control and drift protection control
Receiver gas discharge solenoid valve	SVG	(Y4S)	OFF	Drift protection control
Non-operation unit liquid pipe stop solenoid valve	SVSL	(Y6S)	ON	ON
Indoor unit fan	—	—	Refer to following page for detail. (BS unit & Indoor unit operation mode detail)	Refer to following page for detail. (BS unit & Indoor unit operation mode detail)
Indoor unit expansion valve	EV	—		
BS 20RT	20RT	(Y1S)		
BS 20RH (3 way)	20RH	(Y3S)		

1.4 BS unit & Indoor unit operation mode detail

				Outside unit operation mode			
				Cooling mode	Cooling/Heating mode	Heating mode	Stopping
Indoor unit	Cooling	Thermostat ON	20RH 20RT Indoor Fan Indoor EV	OFF OFF Depend on remote controller Indoor unit control	OFF OFF Depend on remote controller Indoor unit control		
		Thermostat OFF Fan	20RH 20RT Indoor Fan Indoor EV	OFF OFF Depend on remote controller 0 pulse	OFF OFF Depend on remote controller 0 pulse	OFF OFF Depend on remote controller 0 pulse	OFF OFF Depend on remote controller 0 pulse
		Stopping	20RH 20RT Indoor Fan Indoor EV	OFF OFF OFF 0 pulse	OFF OFF OFF 0 pulse	OFF OFF OFF 0 pulse	OFF OFF OFF 0 pulse
	Heating	Thermostat ON	20RH 20RT Indoor Fan Indoor EV		ON ON Depend on remote controller Indoor unit control	ON OFF Depend on remote controller Indoor unit control	
		Thermostat OFF	20RH 20RT Indoor Fan Indoor EV	ON OFF LL 0 pulse	ON OFF LL (200 pulse)	ON OFF LL (200 pulse)	ON OFF LL 0 pulse
		Stopping	20RH 20RT Indoor Fan Indoor EV	ON OFF OFF 0 pulse	OFF ∗1 OFF OFF ∗2	ON OFF OFF (200 pulse)	ON ∗1 OFF OFF 0 pulse

∗1 : The switch for the BS unit is operated when pressure equalization control turns on after cooling/heating mode of other indoor unit is changed or on the timing of oil returns.

∗2 : If 20RH:ON, depend on indoor control (200 pulse).
If 20RH:OFF, 0 pulse.

2. Stop

2.1 Stopping Operation

This operation is used to define the operation of the actuator while the system stops.

2.1.1 When System is in Stop Mode

Parts name	Symbol	Electrical symbol	Actuator function
Compressor	—	(M1C)	OFF
Inverter cooling fan	—	(M1, 2F)	OFF
4 way valve 1	20S1	(Y5S)	Holding
4 way valve 2	20S2	(Y7S)	Holding
Main heat exchanger electronic exp. valve	EV1	(Y1E)	0 pulse
Sub-cooling electronic exp. valve	EV3	(Y3E)	0 pulse
Hot gas bypass solenoid valve	SVP	(Y1S)	OFF
Water heat exchanger oil return solenoid valve	SVE	(Y2S)	OFF
Receiver gas charging solenoid valve	SVL	(Y3S)	OFF
Receiver gas discharge solenoid valve	SVG	(Y4S)	OFF
Non-operation unit liquid pipe stop solenoid valve	SVSL	(Y6S)	ON
Ending conditions	—	—	Indoor unit thermostat ON

2.1.2 Stopping Operation of Slave Units During Master Unit is in Operation with Multi-Outside-Unit System

This operation is used to make adjustments of required refrigerant amount with non-operating slave units while the master unit is in operation.

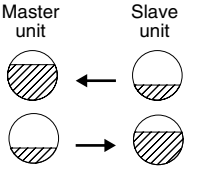
In cooling operation : The system operates in mode A or mode B listed in the table below.

Parts name	Symbol	Electrical symbol	Mode A operation (∗1)	Mode B operation (∗1)
Compressor	—	(M1C)	OFF	OFF
Inverter cooling fan	—	(M1, 2F)	OFF	OFF
4 way valve (Main)	20S1	(Y5S)	Holding	Holding
4 way valve (for heat exchanger)	20S2	(Y7S)	Holding	Holding
Main heat exchanger electronic exp. valve	EV1	(Y1E)	150 to 300 pulse	0 pulse
Sub-cooling electronic exp. valve	EV3	(Y3E)	0 pulse	0 pulse
Hot gas bypass solenoid valve	SVP	(Y1S)	OFF	OFF
Water heat exch. oil return solenoid valve	SVE	(Y2S)	ON	OFF
Receiver gas charging solenoid valve	SVL	(Y3S)	OFF	OFF
Receiver gas discharge solenoid valve	SVG	(Y4S)	OFF	OFF
Non-operation unit liquid pipe stop solenoid valve	SVSL	(Y6S)	OFF	ON
Mode transition conditions			To Mode B when No gas shortage signal is sent from indoor unit	To Mode A when gas shortage signal is sent from indoor unit
Ending conditions			Slave units are required to operate.	

∗1 Mode A or B operation

Mode A : Master unit collects refrigerant.

Mode B : Slave unit storage refrigerant.



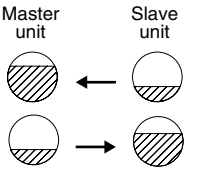
The changeover operation for mode A and B is performed for the reason that the required refrigerant amount varies depending on the indoor unit operation capacity.

In heating operation or simultaneously in cooling / heating operation :
The system operates in mode A or mode B listed in the table below.

Parts name	Symbol	Electrical symbol	Mode A operation	Mode B operation
Compressor	—	(M1C)	OFF	OFF
Inverter cooling fan	—	(M1, 2F)	OFF	OFF
4 way valve (Main)	20S1	(Y5S)	Holding	Holding
4 way valve (for heat exchanger)	20S2	(Y7S)	Holding	Holding
Main heat exchanger electronic exp. valve	EV1	(Y1E)	0 pulse	0 pulse
Sub-cooling electronic exp. valve	EV3	(Y3E)	0 pulse	0 pulse
Hot gas bypass solenoid valve	SVP	(Y1S)	OFF	OFF
Water heat exch. oil return solenoid valve	SVE	(Y2S)	OFF	OFF
Receiver gas charging solenoid valve	SVL	(Y3S)	ON	OFF
Receiver gas discharge solenoid valve	SVG	(Y4S)	OFF	OFF
Non-operation unit liquid pipe stop solenoid valve	SVSL	(Y6S)	OFF	ON
Mode transition conditions			To Mode B when No gas shortage signal is sent from indoor unit	To Mode A when gas shortage signal is sent from indoor unit
Ending conditions			Slave units are required to operate.	

∗ Mode A or B operation

Mode A : Master unit collects refrigerant.
Mode B : Slave unit storage refrigerant.



The changeover operation for mode A and B is performed for the reason that the required refrigerant amount varies depending on the indoor unit operation capacity.

2.1.3 Abnormal Stop

In order to protect compressors, if any of the following items has an abnormal value, the system will make “stop with thermostat OFF” and the malfunction will be determined according to the number of retry times.

Item	Judgement value	Retry number	Malfunction code
1. Low pressure abnormal	10.1psi	3 times in 60 minutes	E4
2. High pressure abnormal	537psi	2 times in 30 minutes	E3
3. Discharge temperature abnormal	275°F	2 times in 100 minutes	F3
4. Power supply abnormal	Reverse phase	No retry	U1
5. Inverter current abnormal	17A for 5 sec. (380V power supply) 25.1A for 260 sec. (220V power supply)	3 times in 60 minutes	L8
6. Radiation fin temperature abnormal	192.2°F	3 times in 60 minutes	L4

3. Standby

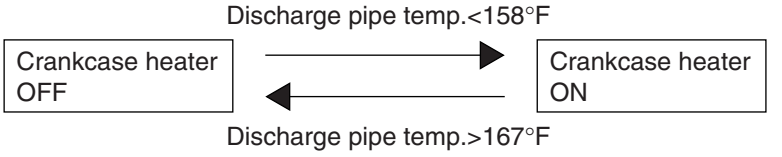
3.1 Restart Standby

Forced standby is performed to prevent frequent repetition of ON/OFF of the compressor, and to equalize pressure in the refrigerant system.

Parts name	Symbol	Electrical symbol	Actuator function
Compressor	—	(M1C)	0 Hz
Inverter cooling fan	—	(M1, 2F)	OFF
4 way valve (Main)	20S1	(Y5S)	Holding
4 way valve (for heat exchanger)	20S2	(Y7S)	Holding
Main heat exchanger electronic exp. valve	EV1	(Y1E)	0 pulse
Sub-cooling electronic exp. valve	EV3	(Y3E)	0 pulse
Hot gas bypass solenoid valve	SVP	(Y1S)	OFF
Water heat exch. oil return solenoid valve	SVE	(Y2S)	OFF
Receiver gas charging solenoid valve	SVL	(Y3S)	OFF
Receiver gas discharge solenoid valve	SVG	(Y4S)	OFF
Non-operation unit liquid pipe stop solenoid valve	SVSL	(Y6S)	ON
Indoor cooling unit fan	—	(M1, 2F)	Remote controller setting
Indoor cooling unit expansion valve	EV	(Y1E)	All indoor EV 0 pulse
Indoor heating unit fan	—	(M1, 2F)	Indoor unit control
Indoor heating unit expansion valve	EV	(Y1E)	All indoor EV 0 pulse
BS 20RH (3 way)	20RH	(Y3S)	Holding
BS 20RT	20RT	(Y1S)	OFF
Ending condition			4 minutes

3.2 Crankcase Heater Control

In order to prevent the refrigerant from dwelling in the compressor in the stopped mode, this mode is used to control the crankcase heater.



4. Startup Control

This startup control is used to provide the following control to reduce the compressor load resulting from liquid return or else during compressor startup, and also determine the position of four way valves.

4.1 Cooling Start-up Control

Both master and slave units operate same time for changing 4 way valve position → Normal operation after completion.

Thermostat ON

Parts name		Symbol	Electrical symbol	Pressure equalization control before start-up	Starting control
Compressor		—	(M1C)	0 Hz	52Hz +2 steps/20 sec. (until Pc-Pe > 71.05 psi)
Inverter cooling fan		—	(M1, 2F)	OFF	Inverter cooling fan control
4 way valve (Main)		20S1	(Y5S)	Holding	OFF
4 way valve (for heat exchanger)		20S2	(Y7S)	Holding	OFF
Main heat exchanger electronic exp. valve		EV1	(Y1E)	0 pulse	2000 pulse
Sub-cooling electronic exp. valve		EV3	(Y3E)	0 pulse	0 pulse
Hot gas bypass solenoid valve		SVP	(Y1S)	OFF	ON
Water heat exch. oil return solenoid valve		SVE	(Y2S)	OFF	OFF
Receiver gas charging solenoid valve		SVL	(Y3S)	OFF	OFF
Receiver gas discharge solenoid valve		SVG	(Y4S)	OFF	OFF
Non-operation unit liquid pipe stop solenoid valve		SVSL	(Y6S)	ON	ON
Indoor unit fan		—	(M1, 2F)	Indoor unit control	Indoor unit control
Indoor unit expansion valve		EV	(Y1E)	0 pulse	0 pluse ⟶ Initial opening
BS 20RH	Cooling	20RH	(Y3S)	OFF	OFF
	Heating				
BS 20RT		20RT	(Y1S)	OFF	OFF
Ending condition				1 minute	Max. 5 minutes

4.2 Heating Start-up Control

Both master and slave units operate same time for changing 4 way valve position → Normal operation after completion.

Thermostat ON ↓

Parts name	Symbol	Electrical symbol	Pressure equalization control before start-up	Starting control
Compressor	—	(M1C)	0 Hz	52Hz +2 steps/20 sec. (till Pc-Pe > 71.05 psi)
Inverter cooling fan	—	(M1, 2F)	OFF	Inverter cooling fan control
4 way valve (Main)	20S1	(Y5S)	Holding	ON
4 way valve (for heat exchanger)	20S2	(Y7S)	Holding	OFF
Main heat exchanger electronic exp. valve	EV1	(Y1E)	0 pulse	180 pulse
Sub-cooling electronic exp. valve	EV3	(Y3E)	0 pulse	0 pulse
Hot gas bypass solenoid valve	SVP	(Y1S)	OFF	ON
Water heat exch. oil return solenoid valve	SVE	(Y2S)	OFF	OFF
Receiver gas charging solenoid valve	SVL	(Y3S)	OFF	OFF
Receiver gas discharge solenoid valve	SVG	(Y4S)	OFF	OFF
Non-operation unit liquid pipe stop solenoid valve	SVSL	(Y6S)	ON	ON
Indoor unit fan	—	(M1, 2F)	Indoor unit control	Indoor unit control
Indoor unit expansion valve	EV	(Y1E)	0 pulse	Indoor unit control
BS 20R	20RH	(Y3S)	ON	ON
BS 20RT	20RT	(Y1S)	OFF	OFF
Ending condition			1 minute	Max. 6 minutes 40 sec.

4.3 Pressure Equalizing Control

This pressure equalization control is used to equalize the pressure of discharge piping and suction piping in order to reduce refrigerant passing noise when changing over the BS units.

[Starting conditions]

The temperature control of indoor units with thermostat ON does not match up with the state of the BS unit changeover valve to which the indoor units are connected.

Parts name		Symbol	Electrical symbol	Pressure equalization control
Compressor		—	(M1C)	74Hz
4 way valve (Main)		20S1	(Y5S)	OFF
4 way valve (for heat exchanger)		20S2	(Y7S)	OFF
Main electronic expansion valve		EV1	(Y1E)	2000 pulse
Sub-cooling electronic expansion valve		EV3	(Y3E)	0 pulse
Hot gas bypass solenoid valve		SVP	(Y1S)	ON
Water heat exch. oil return solenoid valve		SVE	(Y2S)	OFF
Receiver gas charging solenoid valve		SVL	(Y3S)	OFF
Receiver gas		SVG	(Y4S)	OFF
Non-operation unit liquid pipe stop		SVSL	(Y6S)	ON
Indoor cooling unit fan		—	(M1, 2F)	No instruction
Indoor cooling unit		EV	(Y1E)	No instruction
Indoor heating unit fan		—	(M1, 2F)	OFF
Indoor heating unit expansion valve		EV	(Y1E)	192 pulse
BS 20RH	Cooling	20RH	(Y3S)	No instruction
	Heating			No instruction
BS 20RT		20RT	(Y1S)	OFF
Ending condition				Max. 5 min.

5. Normal Control

5.1 Compressor Control

5.1.1 Compressor Control

Compressor PI Control

Carries out the compressor capacity PI control to maintain Te at constant during cooling operation and Tc at constant during heating operation to ensure stable unit performance.

[Cooling operation]

Controls compressor capacity to adjust Te to achieve target value (TeS).

Te : Low pressure equivalent saturation temperature (°F)

TeS : Target Te value
(Varies depending on Te setting, operating frequency, etc.)

Te setting

L	M (Normal) (factory setting)	H
37.4	42.8	48.2

[Heating operation]

Controls compressor capacity to adjust Tc to achieve target value (TcS).

Tc : High pressure equivalent saturation temperature (°F)

TcS : Target Tc value
(Varies depending on Tc setting, operating frequency, etc.)

Tc setting

L	M (Normal) (factory setting)	H
109.4	114.8	120.2

[Cooling/Heating simultaneous operation]

Controls compressor capacity to adjust Te to achieve target value (TeS) and Tc to achieve target value (TcS) at the same time.

Te setting

L	M (Normal) (factory setting)	H
37.4	42.8	48.2

Te : Low pressure equivalent saturation temperature (°F)

TeS : Target Te value
(Varies depending on Te setting, operating frequency, etc.)

Tc setting

L	M (Normal) (factory setting)	H
109.4	114.8	120.2

Tc : High pressure equivalent saturation temperature (°F)

TcS : Target Tc value
(Varies depending on Tc setting, operating frequency, etc.)

5.1.2 Compressor Operation Frequency Steps

1. One outside unit installation

Step No.	Master	
1	52Hz	← Start-up
2	57Hz	
3	62Hz	
4	68Hz	
5	74Hz	
6	81Hz	
7	88Hz	
8	96Hz	
9	104Hz	
10	110Hz	
11	112Hz	
12	120Hz	
13	130Hz	
14	141Hz	
15	156Hz	
16	168Hz	
17	177Hz	
18	189Hz	
19	202Hz	
20	210Hz	
21	216Hz	
22	230Hz	

2. Two outside units connection installation

A : 1 Compressor operation

Step No.	Master
1	52Hz
2	57Hz
3	62Hz
4	68Hz
5	74Hz
6	81Hz
7	88Hz
8	96Hz
9	104Hz
10	110Hz
11	112Hz
12	120Hz
13	130Hz
14	141Hz

B : 2 Compressor operation

Step No.	Master	Slave 1	
9	52Hz	52Hz	← Start-up
10	57Hz	57Hz	
11	62Hz	62Hz	
12	68Hz	68Hz	
13	71Hz	71Hz	
14	74Hz	74Hz	
15	81Hz	81Hz	
16	88Hz	88Hz	
17	92Hz	92Hz	
18	96Hz	96Hz	
19	104Hz	104Hz	
20	110Hz	110Hz	
21	112Hz	112Hz	
22	120Hz	120Hz	
23	130Hz	130Hz	
24	141Hz	141Hz	
25	156Hz	156Hz	
26	168Hz	168Hz	
27	177Hz	177Hz	
28	189Hz	189Hz	
29	202Hz	202Hz	
30	210Hz	210Hz	
31	216Hz	216Hz	
32	230Hz	230Hz	

3. Three outside units connection installation

A : 1 Compressor operation

Step No.	Master
1	52Hz
2	57Hz
3	62Hz
4	68Hz
5	74Hz
6	81Hz
7	88Hz
8	96Hz
9	104Hz
10	110Hz
11	112Hz
12	120Hz
13	130Hz
14	141Hz

B : 2 Compressor operation

Step No.	Master	Slave 1
9	52Hz	52Hz
10	57Hz	57Hz
11	62Hz	62Hz
12	68Hz	68Hz
13	71Hz	71Hz
14	74Hz	74Hz
15	81Hz	81Hz
16	88Hz	88Hz
17	92Hz	92Hz
18	96Hz	96Hz
19	104Hz	104Hz
20	110Hz	110Hz
21	112Hz	112Hz

C : 3 Compressor operation

Step No.	Master	Slave 1	Slave 2	
14	52Hz	52Hz	52Hz	← Start-up
15	57Hz	57Hz	57Hz	
16	62Hz	62Hz	62Hz	
17	65Hz	65Hz	65Hz	
18	68Hz	68Hz	68Hz	
19	71Hz	71Hz	71Hz	
20	74Hz	74Hz	74Hz	
21	81Hz	81Hz	81Hz	
22	88Hz	88Hz	88Hz	
23	96Hz	96Hz	96Hz	
24	104Hz	104Hz	104Hz	
25	110Hz	110Hz	110Hz	
26	112Hz	112Hz	112Hz	
27	120Hz	120Hz	120Hz	
28	130Hz	130Hz	130Hz	
29	141Hz	141Hz	141Hz	
30	156Hz	156Hz	156Hz	
31	168Hz	168Hz	168Hz	
32	177Hz	177Hz	177Hz	
33	189Hz	189Hz	189Hz	
34	202Hz	202Hz	202Hz	
35	210Hz	210Hz	210Hz	
36	216Hz	216Hz	216Hz	
37	230Hz	230Hz	230Hz	

* Depending on operational conditions, operation pattern may be different from the description above.

5.2 Electronic Expansion Valve Control

Main Electronic Expansion Valve EV1 Control

Carries out the electronic expansion valve (Y1E) PI control to maintain the evaporator outlet superheated degree (SH) at constant during heating operation to make maximum use of the outside unit heat exchanger (evaporator).

SH = Ts - Te

SH : Evaporator outlet superheated degree (°F)

Ts : Suction pipe temperature detected by thermistor R2T (°F)

Te : Low pressure equivalent saturation temperature (°F)

The optimum initial value of the evaporator outlet superheated degree is 41°F, but varies depending on the discharge pipe superheated degree of inverter compressor.

Sub-cooling Electronic Expansion Valve EV3 Control

[Cooling operation]

Makes PI control of the electronic expansion valve (Y3E) to keep the superheated degree of the outlet gas pipe on the evaporator side for the full use of the sub-cooling heat exchanger.

SH = Tsh -Te

SH : Outlet superheated degree of evaporator (°F)

Tsh : Suction pipe temperature detected with the thermistor R5T (°F)

Te : Low pressure equivalent saturation temperature (°F)

[Heating operation]

To lower the discharge temperature when the discharge temperature is over 203°F, makes PI control of the electronic expansion valve (Y3E) to keep the superheated degree of the outlet gas pipe on the evaporator side for the full use of the sub-cooling heat exchanger. (When the discharge temperature is lower than 203°F, EV3 opening is 0 pulse.)

SH = Tsh -Te

SH : Outlet superheated degree of evaporator (°F)

Tsh : Suction pipe temperature detected with the thermistor R5T (°F)

Te : Low pressure equivalent saturation temperature (°F)

5.3 Heat Exchange Mode in Heating Operation or Simultaneous Cooling / Heating Operation

In heating or simultaneous cooling / heating operation, a target condensing and evaporating temperature can be secured by switching the water heat exchanger of the outside unit into evaporator or condenser with load.

One outside unit installation

	Master unit
Four-way changeover valve for heat exchanger [Y7S] (For the application of heat exchanger)	OFF (Condenser)
Content of the control of electronic expansion valve [Y1E]	Control of heat exchange capacity balance

ΔGR>0 ↓ ↑ ΔGR<0

	Master unit
Four-way changeover valve for heat exchanger [Y7S] (For the application of heat exchanger)	ON (Evaporator)
Content of the control of electronic expansion valve [Y1E]	Control of heat exchange capacity balance

Note 1: ΔGR=Target of heat exchange capacity balance – Actual measurement of heat balance
① ΔGR>0: Insufficient evaporation (Excessive condensation)
② ΔGR<0: Insufficient condensation (Excessive evaporation)
2: Control of heat exchange capacity balance
Control the electronic expansion valve so that Te or Tc will obtain the target value.

Two outside units installation

	Master unit	Slave unit 1
Four-way changeover valve for heat exchanger [Y7S] (For the application of heat exchanger)	OFF (Condenser)	OFF (Condenser)
Content of the control of electronic expansion valve [Y1E]	Control of heat exchange capacity balance	Control of heat exchange capacity balance

ΔGR>0 ↓ ↑ ΔGR<0

	Master unit	Slave unit 1
Four-way changeover valve for heat exchanger [Y7S] (For the application of heat exchanger)	OFF (Condenser)	ON (Evaporator)
Content of the control of electronic expansion valve [Y1E]	Control of heat exchange capacity balance	0 pulse

ΔGR>0 ↓ ↑ ΔGR<0

ΔGR>0 ↓

	Master unit	Slave unit 1
Four-way changeover valve for heat exchanger [Y7S] (For the application of heat exchanger)	OFF (Condenser)	ON (Evaporator)
Content of the control of electronic expansion valve [Y1E]	Control of heat exchange capacity balance	Control of heat exchange capacity balance

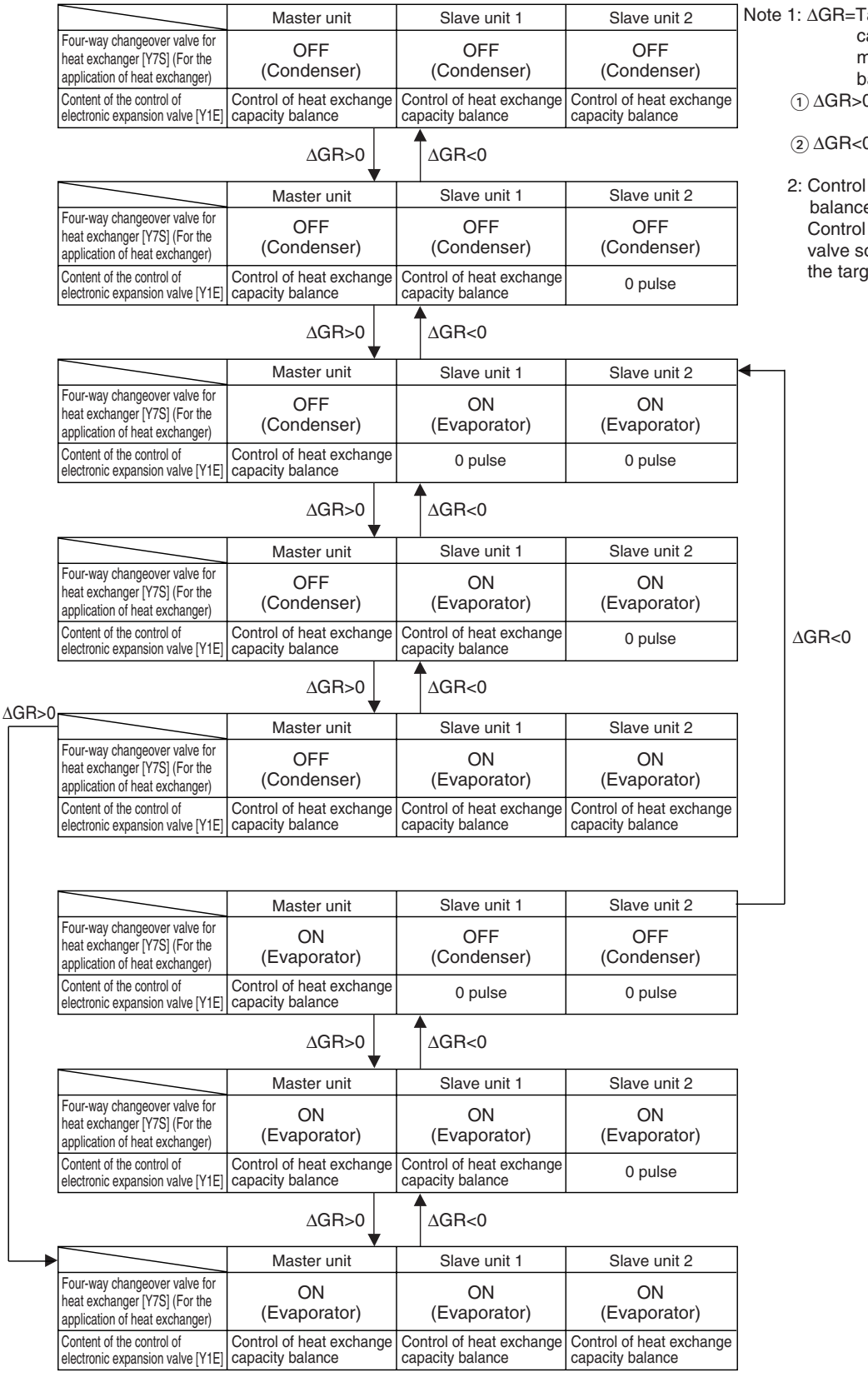
ΔGR<0 ↑

	Master unit	Slave unit 1
Four-way changeover valve for heat exchanger [Y7S] (For the application of heat exchanger)	ON (Evaporator)	ON (Evaporator)
Content of the control of electronic expansion valve [Y1E]	Control of heat exchange capacity balance	0 pulse

ΔGR>0 ↓ ↑ ΔGR<0

	Master unit	Slave unit 1
Four-way changeover valve for heat exchanger [Y7S] (For the application of heat exchanger)	ON (Evaporator)	ON (Evaporator)
Content of the control of electronic expansion valve [Y1E]	Control of heat exchange capacity balance	Control of heat exchange capacity balance

Three outside units installation



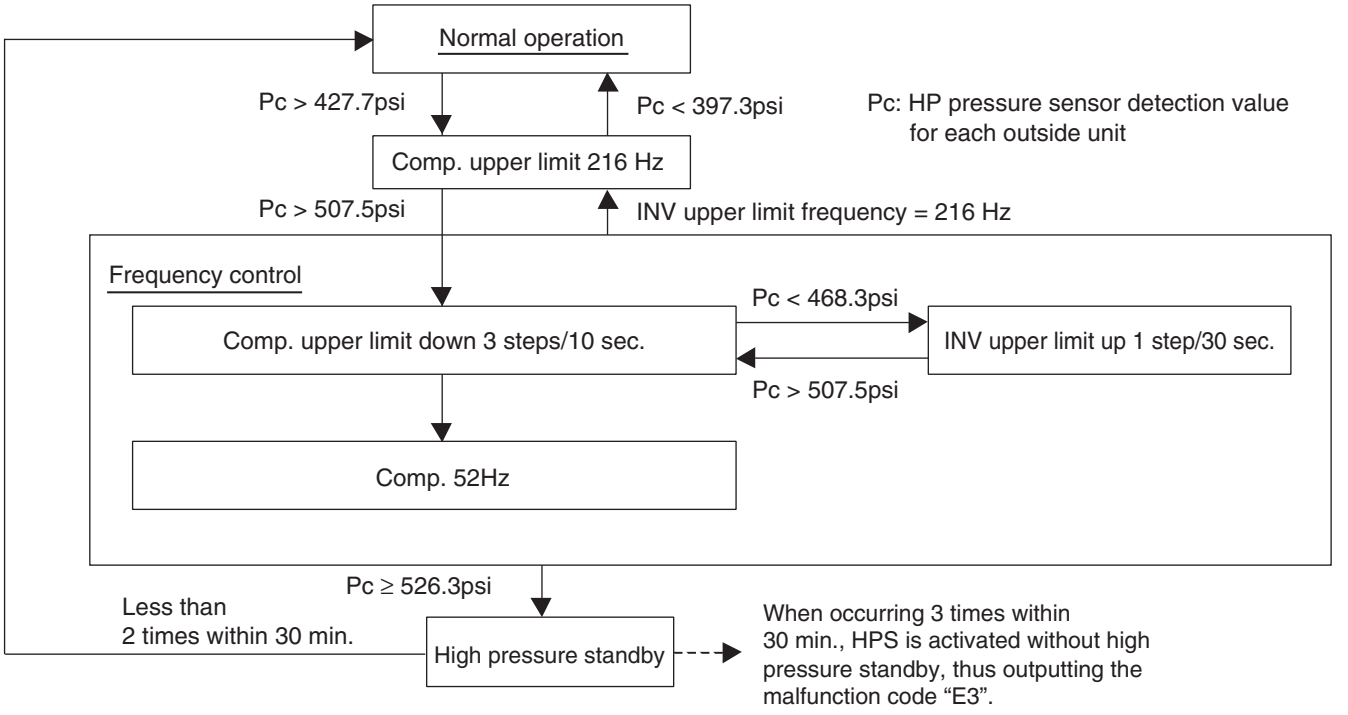
Note 1: ΔGR=Target of heat exchange capacity balance – Actual measurement of heat balance
① ΔGR>0: Insufficient evaporation (Excessive condensation)
② ΔGR<0: Insufficient condensation (Excessive evaporation)
2: Control of heat exchange capacity balance
Control the electronic expansion valve so that Te or Tc will obtain the target value.

6. Protection Control

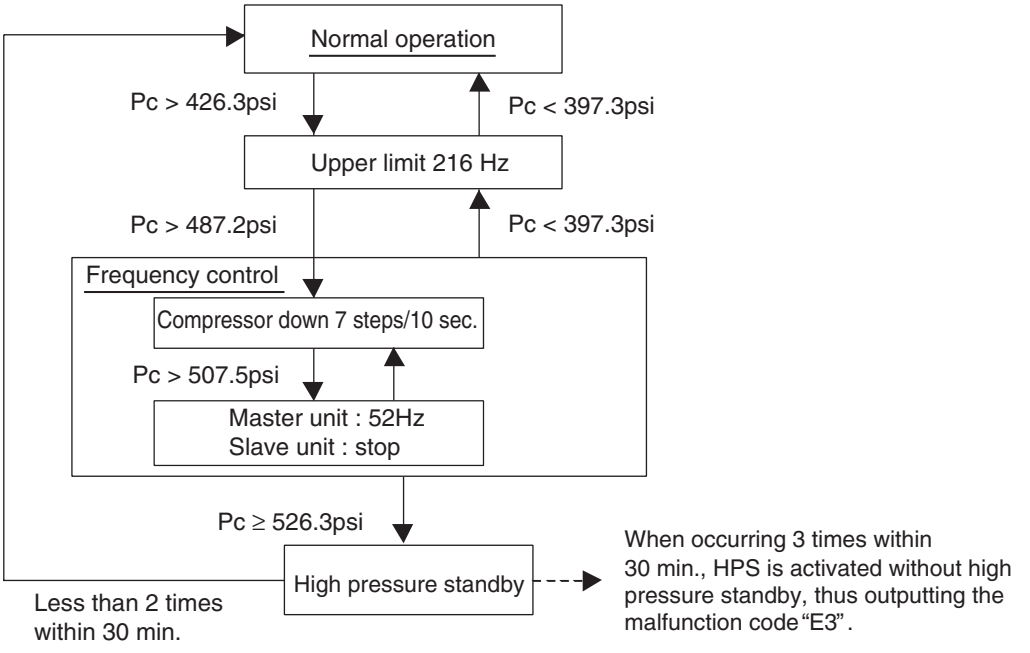
6.1 High Pressure Protection Control

This high pressure protection control is used to prevent the activation of protection devices due to abnormal increase of high pressure and to protect compressors against the transient increase of high pressure.

[In cooling operation]



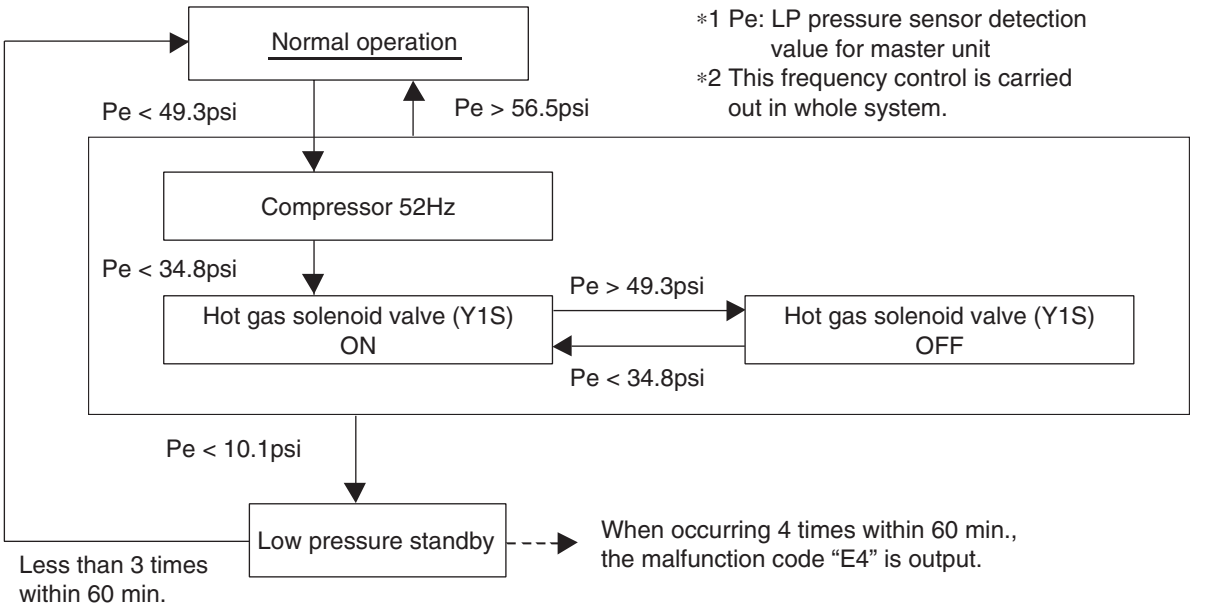
[In heating operation or simultaneous cooling/heating operation]



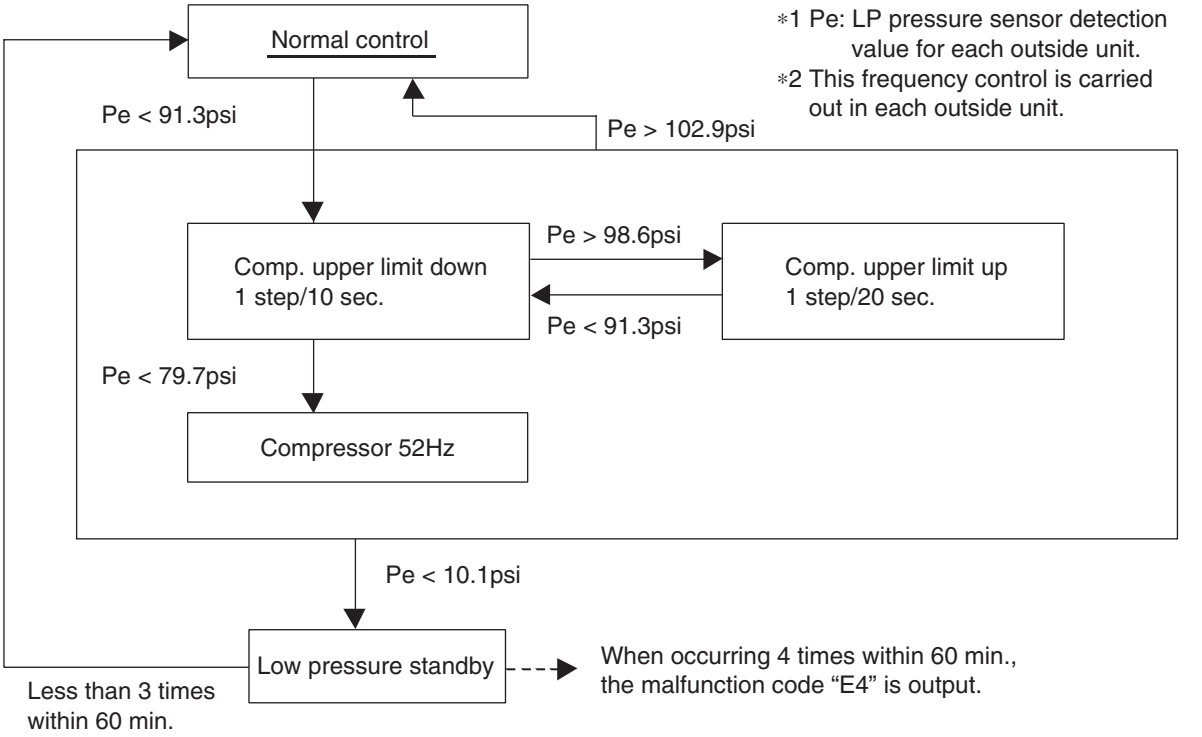
6.2 Low Pressure Protection Control

This low pressure protection control is used to protect compressors against the transient decrease of low pressure.

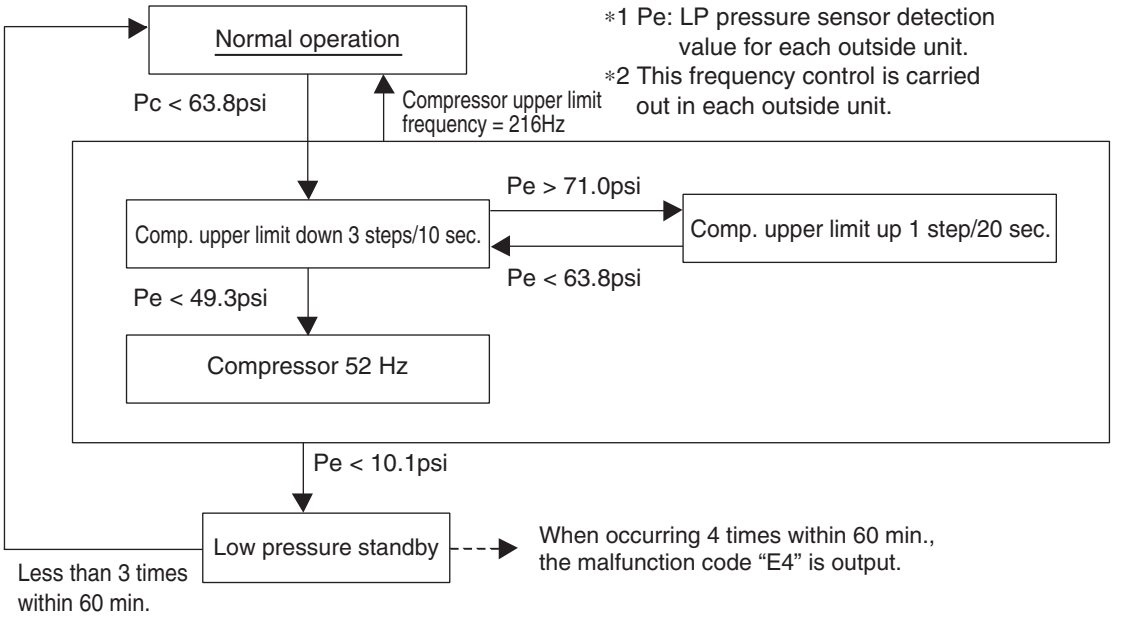
[In cooling operation]



[In heating or cooling/heating simultaneous operation] (When the outside unit heat exchanger is used as evaporator.)



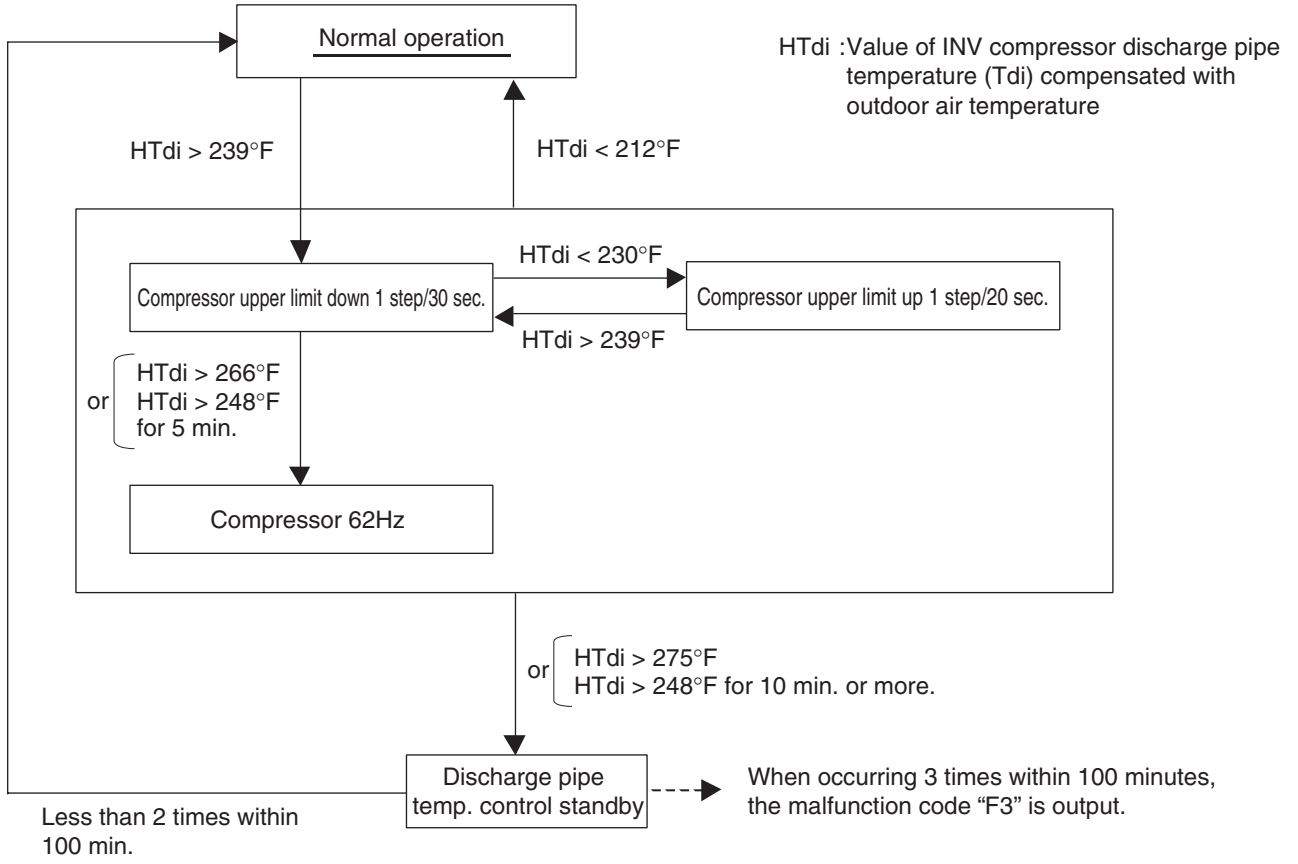
[In heating or cooling/heating simultaneous operation] (When the outside unit heat exchanger is used as condenser.)



6.3 Discharge Pipe Protection Control

This discharge pipe protection control is used to protect the compressor internal temperature against a malfunction or transient increase of discharge pipe temperature.
∗Discharge pipe protection control is carried out in each outside unit.

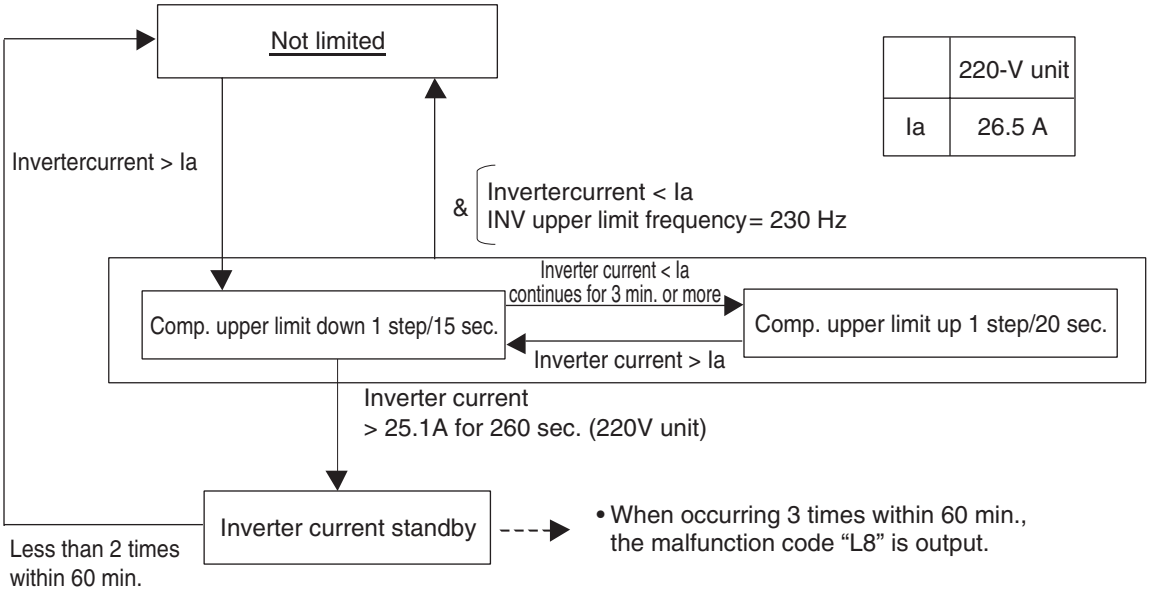
[INV compressor]



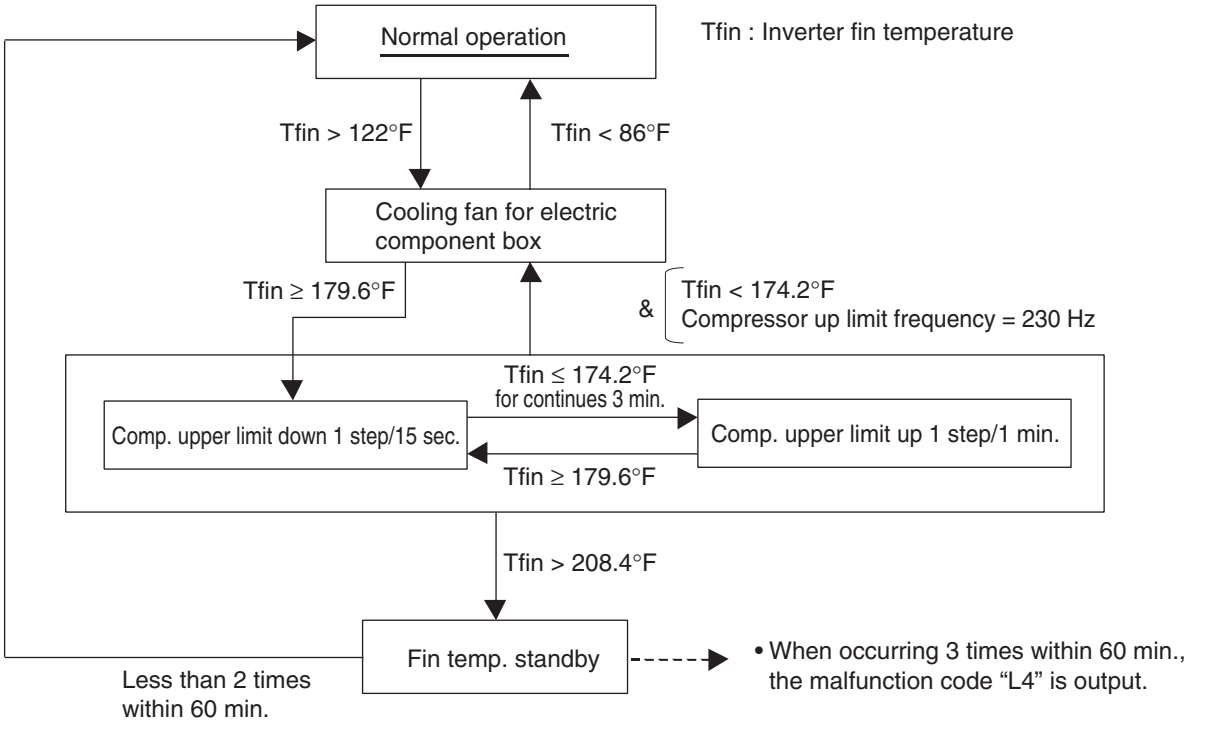
6.4 Inverter Protection Control

Inverter current protection control and inverter fin temperature control are performed to prevent tripping due to a malfunction, or transient inverter overcurrent, and fin temperature increase.
∗This control is carried out in each outside unit.

[Inverter overcurrent protection control]



[Inverter fin temperature control]

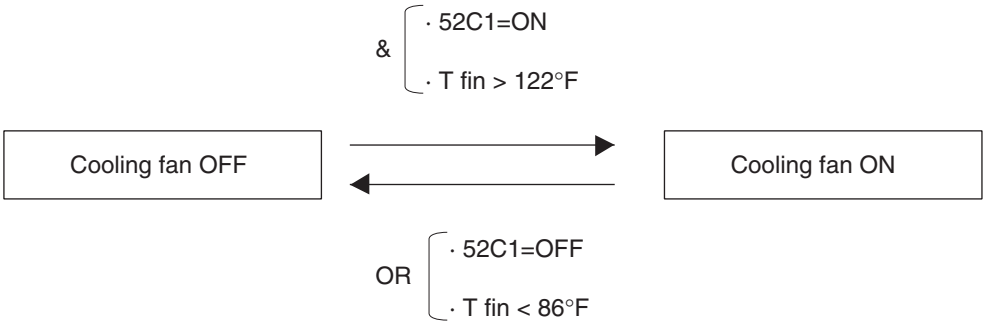


6.5 Cooling Fan Control

his function is used for ON-OFF control of the cooling fan to cool the inverter. This cooling fan operates only when the temperature of the inverter fan is high, in order to reduce the operating time of the fan.

[Details]

Control the cooling fan by each outside unit.



7. Special Operation

7.1 Oil Return Operation

In order to prevent the running-out of refrigerating machine oil in the compressor, the oil flowing out from the compressor to the system side is collected through the oil return operation.

7.1.1 Oil Return Operation in Cooling Operation

[Starting conditions]

Start oil return operation in cooling operation referring to the following conditions.

* Cumulative oil return amount
* Timer

Cumulative compressor operating time after power supply turns on exceeds 2 hours and the time after the completion of previous oil return operation exceeds 8 hours.

Furthermore, the cumulative oil return is calculated according to Tc, Te, and compressor load.

Cooling oil return

Parts name	Symbol	Electrical symbol	Preperation	During oil return operation		After oil return operation
Compressor	—	(M1C)		104 Hz		52 Hz
4 way valve (Main)	20S1	(Y5S)		OFF		OFF
4 way valve (for heat exchanger)	20S2	(Y7S)		OFF		OFF
Main heat exchanger electronic expansion valve	EV1	(Y1E)		2000 pulse		2000 pulse
Sub-cooling electronic expansion valve	EV3	(Y3E)		0 pulse		0 pulse
Hot gas bypass solenoid valve	SVP	(Y1S)		ON		ON
Water heat exch. oil return solenoid valve	SVE	(Y2S)		OFF		OFF
Receiver gas charging solenoid valve	SVL	(Y3S)		OFF		OFF
Receiver gas discharge solenoid valve	SVG	(Y4S)		OFF		OFF
Liquid pipe stop solenoid valve	SVSL	(Y6S)		ON		ON
Indoor cooling unit fan	—	(M1, 2F)	Same as normal cooling operation	Thermostat on/Stop : Indoor unit control Thermostat off : OFF		Normal control
Indoor cooling unit expansion valve	EV	(Y1E)		Stop/thermostat off: 200 pls Thermostat ON: Indoor unit control		Normal control
Indoor heating unit fan	—	(M1, 2F)		—		—
Indoor heating unit expansion valve	EV	(Y1E)		—		—
BS 20RH Cooling	20RH	(Y3S)		ON	OFF	OFF
BS 20RT	20RT	(Y1S)		OFF	OFF	OFF
Ending condition			20 sec.	Max.3 min.	Max.3 min.	Max. 3min.30sec.

7.1.2 Oil Return Operation in Heating or Cooling/Heating simultaneous Operation

[Starting conditions]

Start oil return operation in heating operation referring to the following conditions.
Cumulative compressor operating time after power supply turns on exceeds 2 hours and the time after the completion of previous oil return operation exceeds 8 hours. And cumulative oil return is calculated based on Tc, Te compressor load.

Heating & Cooling/heating simultaneous operation oil return

Parts name		Symbol	Electrical symbol	Preperation	During oil return operation		After oil return operation
Compressor		—	(M1C)	▲	104 Hz		74 Hz
4 way valve 1		20S1	(Y5S)		OFF		ON
4 way valve 2		20S2	(Y7S)		OFF		Heat exchanger mode
Main heat exchanger electronic expansion valve		EV1	(Y1E)		2000 pulse		20S2=OFF : 2000 pulse 20S2=ON : 180 pulse
Sub-cooling electronic expansion valave		EV3	(Y3E)		0 pulse		0 pulse
Hot gas bypass solenoid valve		SVP	(Y1S)		ON		ON
Water heat exch. oil return solenoid valve		SVE	(Y2S)		OFF		OFF
Receiver gas charging solenoid valve		SVL	(Y3S)		OFF		OFF
Receiver gas discharge solenoid valve		SVG	(Y4S)		OFF		OFF
Liquid pipe stop solenoid valve		SVSL	(Y6S)		ON		ON
Indoor cooling unit fan		—	(M1, 2F)	Same as normal heating operation	Thermostat on/Stop : Indoor unit control Thermostat off : OFF		Normal control
Indoor cooling unit expansion valve		EV	(Y1E)		320 pulse		Normal control
Indoor heating unit fan		—	(M1, 2F)		OFF		Indoor unit control
Indoor heating unit expansion valve		EV	(Y1E)		320 pulse		Normal control
BS 20RH	Cooling	20RH	(Y3S)		ON	OFF	OFF
	Heating				ON	OFF	ON
BS 20RT		20RT	(Y1S)	▼	OFF	OFF	OFF
Ending condition				2 min.	Max.2 min.	Max.4 min.	Max.3 min.

7.2 Oil Return Operation of Water Heat Exchanger

[Oil return operation of Water heat exchanger]

When the water heat exchanger is used as evaporator during heating or simultaneous cooling/ heating operation, the operation that the oil accumulated in the water heat exchanger is returned to compressor is conducted.

[IN condition]

After a certain continuous period of time has passed under the following conditions, oil return operation starts.

& • 20S2 = 1 (Water heat exchanger is an evaporator.)
• Tg – Te > 18°F
• Elapse of a certain period of time

Water heat exchanger oil return control

Parts name	Symbol	Electrical symbol	Water heat exchanger oil return control
Compressor	—	(M1C)	52 Hz
4 way valve (Main)	20S1	(Y5S)	ON
4 way valve (for heat exchanger)	20S2	(Y7S)	OFF
Main heat exchanger electronic expansion valve	EV1	(Y1E)	300 pulse
Sub-cooling electronic expansion valve	EV3	(Y3E)	180 pulse
Hot gas bypass solenoid valve	SVP	(Y1S)	ON
Water heat exch. oil return solenoid valve	SVE	(Y2S)	ON
Receiver gas charging solenoid	SVL	(Y3S)	OFF
Receiver gas discharge solenoid valve	SVG	(Y4S)	OFF
Non-operation unit liquid pipe stop solenoid valve	SVSL	(Y6S)	ON
Indoor cooling unit fan	—	(M1, 2F)	↑
Indoor cooling unit expansion valve	EV	(Y1E)	Normal control
Indoor heating unit fan	—	(M1, 2F)	↓
Indoor heating unit expansion valve	EV	(Y1E)	Tharmostat on : Normal control Tharmostat off/Stop : 500 pulse
BS 20RH Cooling / Heating	20RH	(Y3S)	↕ Normal control
BS 20RT	20RT	(Y1S)	
Ending condition			Max.90 sec.

7.3 Pump-down Residual Operation Control

If any liquid refrigerant remains in the heat exchanger during compressor startup, the liquid refrigerant will enter the compressor, resulting in the dilution of the refrigerating machine oil in the compressor and the degradation of lubricating capacity.
Therefore, before the compressor stops, pump-down operation is performed to collect the refrigerant in the heat exchanger.

7.3.1 Cooling Operation Mode

Parts name	Symbol	Electrical symbol	Master unit operation	Slave unit operation
Compressor	—	(M1C)	Current step	OFF
Inverter cooling fan	—	(M1, 2F)	Inverter cooling fan control	Inverter cooling fan control
4 way valve (Main)	20S1	(Y5S)	OFF	OFF
4 way valve (for heat exchanger)	20S2	(Y7S)	OFF	OFF
Main heat exchanger electronic exp. valve	EV1	(Y1E)	2000 pulse	0 pulse
Sub-cooling electronic exp. valve	EV3	(Y3E)	0 pls	0 pulse
Hot gas bypass solenoid valve	SVP	(Y1S)	ON	OFF
Water heat exch. oil return solenoid valve	SVE	(Y2S)	OFF	OFF
Receiver gas charging solenoid valve	SVL	(Y3S)	OFF	OFF
Receiver gas discharge solenoid valve	SVG	(Y4S)	OFF	OFF
Non-operation unit liquid pipe stop solenoid valve	SVSL	(Y6S)	OFF	ON
Indoor cooling unit fan	—	(M1, 2F)	No instruction	
Indoor cooling unit expansion valve	EV	(Y1E)	All 0 pulse	
BS 20RH	20RH	(Y3S)	BS unit control	
BS 20RT	20RT	(Y1S)	BS unit control	
Ending condition			Max. 5 min.	

7.3.2 Heating & Simultaneous Cooling/Heating Mode

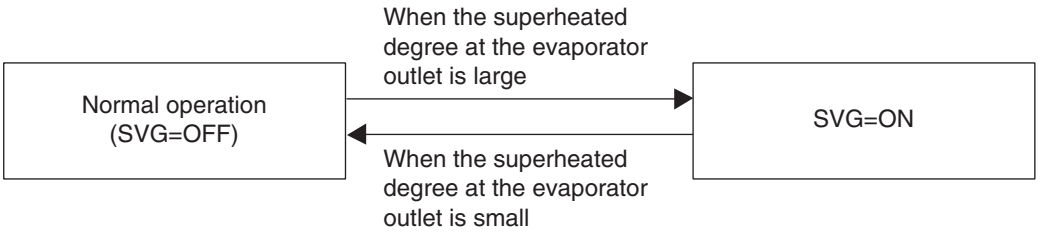
Parts name	Symbol	Electrical symbol	Master unit operation	Slave unit operation
Compressor	—	(M1C)	Current step	OFF
Inverter cooling fan	—	(M1, 2F)	Inverter cooling fan control	Inverter cooling fan control
4 way valve 1	20S1	(Y5S)	ON	ON
4 way valve 2	20S2	(Y7S)	Holding	Holding
Main heat exchanger electronic exp. valve	EV1	(Y1E)	20S2=OFF: 2000 pulse 20S2=ON : 0 pulse	0 pulse
Sub-cooling electronic exp. valve	EV3	(Y3E)	0 pulse	0 pulse
Hot gas bypass solenoid valve	SVP	(Y1S)	ON	OFF
Water heat exch. oil return solenoid valve	SVE	(Y2S)	OFF	OFF
Receiver gas charging solenoid valve	SVL	(Y3S)	OFF	OFF
Receiver gas discharge solenoid valve	SVG	(Y4S)	OFF	OFF
Non-operation unit liquid pipe stop solenoid valve	SVSL	(Y6S)	OFF	ON
Indoor cooling unit fan	—	(M1, 2F)	No instruction	
Indoor cooling unit expansion valve	EV	(Y1E)	All 0 pulse	
Indoor heating unit fan	—	(M1, 2F)	No instruction	
Indoor heating unit expansion valve	EV	(Y1E)	All 500 pulse	
BS 20RH	20RH	(Y3S)	BS unit control	
BS 20RT	20RT	(Y1S)	OFF	
Ending condition			Max. 5 min.	

7.4 Refrigerant Drift Prevention

"Refrigerant drift prevention control" is carried out, in order to prevent refrigerant drift among outside units during heating operation using outside multiple connection. Excessively charged refrigerant in outside units are collected and transferred to other outside units that are running out of gas by controlling the solenoid valve.

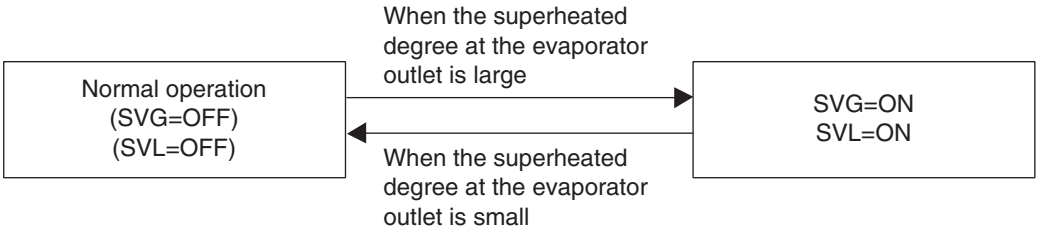
(1) In case of cooling/heating changeover connection

When the superheated at the evaporator outlet degree is large, open the solenoid valve (SVG) for venting receiver gas of the outside units that are running out of gas.



(2) In case of cooling/heating simultaneous connection

When the superheated degree at the evaporator outlet is large, open the solenoid valve (SVG) for venting receiver gas of the outside units that are running out of gas and the solenoid valve (SVL) for pressurizing the receiver of the excessively charged outside units.



8. Other Control

8.1 Outside Unit Rotation

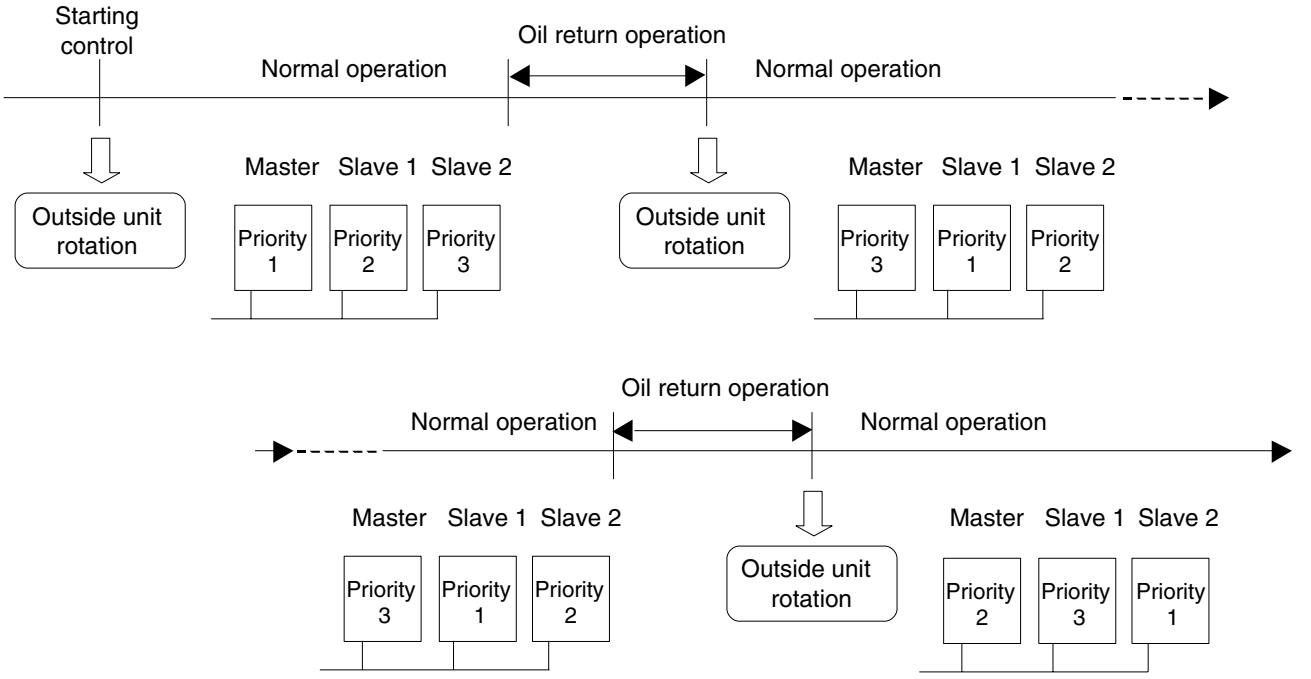
In the case of multi-outside-unit system, this outside unit rotation is used to prevent the compressor from burning out due to unbalanced oil level between outside units.

[Details of outside unit rotation]
In the case of multi-outside-unit system, each outside unit is given an operating priority for the control.
Outside unit rotation makes it possible to change the operating priority of outside units.
Thus, the system becomes free of compressors that stop over an extended period of time at the time of partial loading, preventing unbalanced oil level.

[Timing of outside unit rotation]

- After oil return operation
- At the beginning of the starting control

Example) The following diagram shows outside unit rotation in combination of 3 outside units.



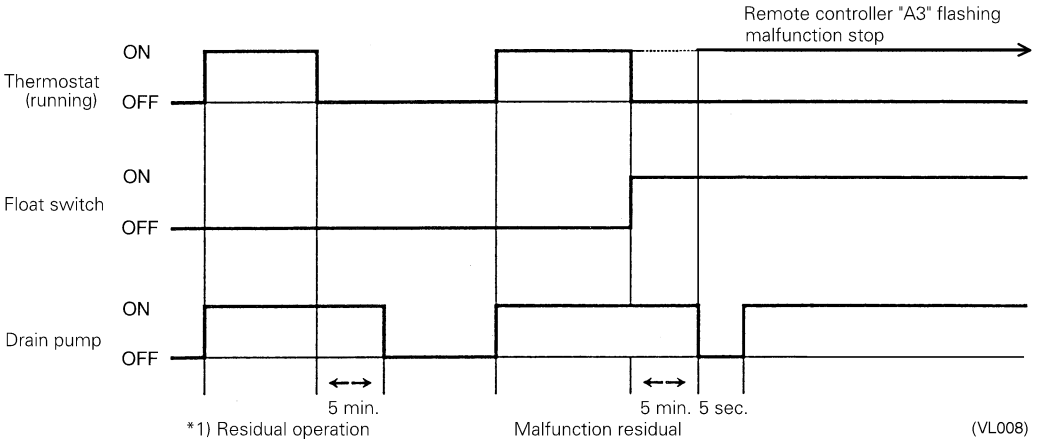
* "Master unit", "slave unit 1" and "slave unit 2" in this section are the names for installation. They are determined in installation work, and not changed thereafter. (These names are different from "master unit" and "slave unit" for control.)
The outside unit connected the control wires (F1 and F2) for the indoor unit should be designated as master unit
Consequently, The LED display on the main PCB for "master unit", "slave unit 1" and "slave unit 2" do not change. (Refer to the page 95.)

9. Outline of Control (Indoor Unit)

9.1 Drain Pump Control

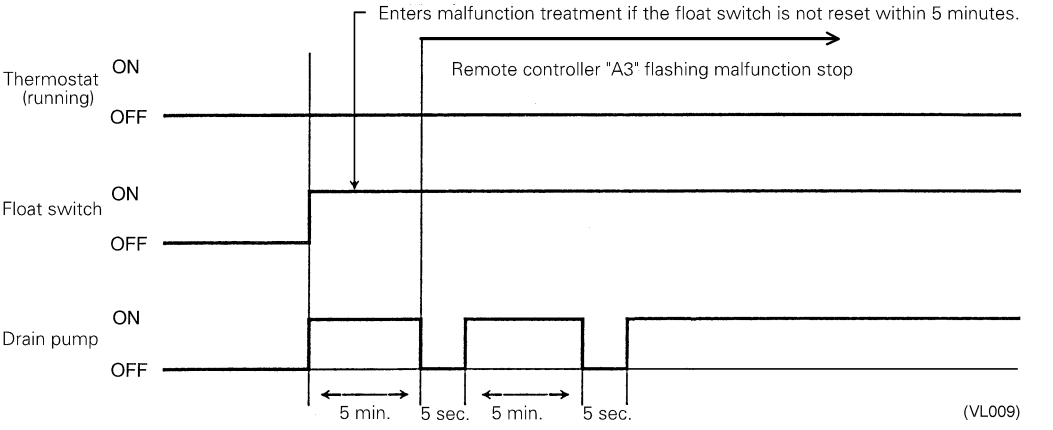
1. The drain pump is controlled by the ON/OFF buttons (4 button (1) - (4) given in the figure below).

9.1.1 When the Float Switch is Tripped While the Cooling Thermostat is ON:

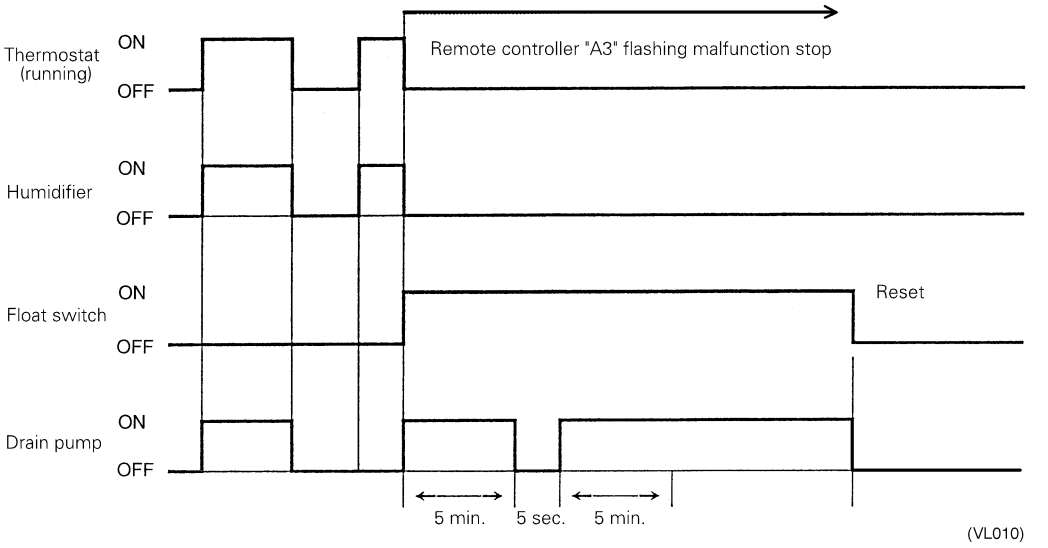


∗ 1. The objective of residual operation is to completely drain any moisture adhering to the fin of the indoor unit heat exchanger when the thermostat goes off during cooling operation.

9.1.2 When the Float Switch is Tripped During Cooling OFF by Thermostat:

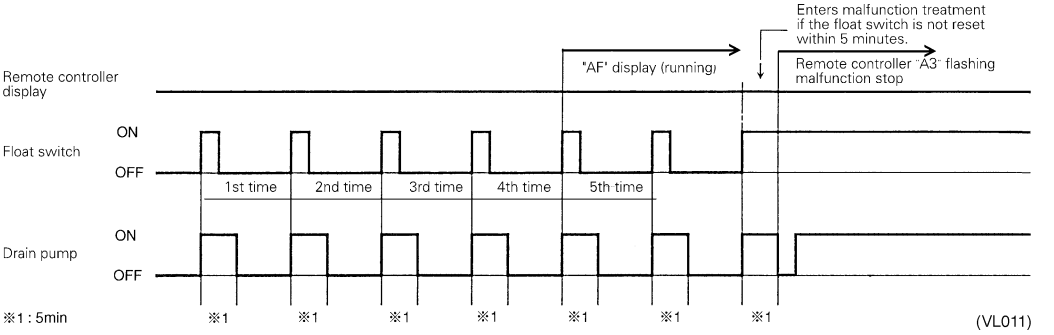


9.1.3 When the Float Switch is Tripped During Heating Operation:



During heating operation, if the float switch is not reset even after the 5 minutes operation, 5 seconds stop, 5 minutes operation cycle ends, operation continues until the switch is reset.

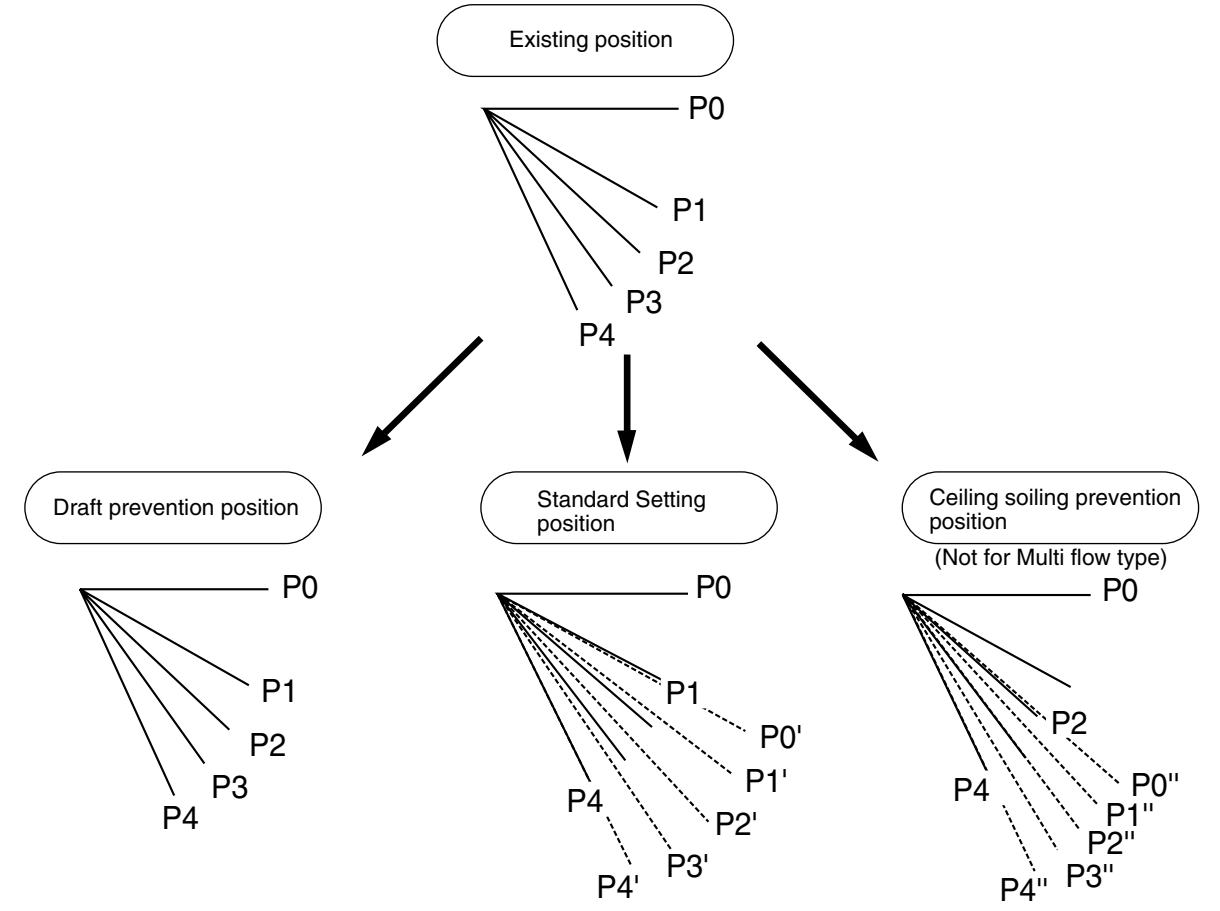
9.1.4 When the Float Switch is Tripped and “AF” is Displayed on the Remote Controller:



Note: If the float switch is tripped five times in succession, a drain malfunction is determined to have occurred. “AF” is then displayed as operation continues.

9.2 Louver Control for Preventing Ceiling Dirt

We have added a control feature that allows you to select the range of in which air direction can be adjusted in order to prevent the ceiling surrounding the air discharge outlet of ceiling mounted cassette type units from being soiled. (This feature is available on double flow, multi-flow and corner types.)



Draft prevention position	P0	P1	P2	P3	P4	Same as existing position
		Range of direction adjustment				
Standard position	Prohibited	P0'	P1'	P2'	P3'	P4'	Separated into 5 positions (P1 - 4)
		Range of direction adjustment				
Dirt prevention position	Prohibited	P0"	P1"	P2"	P3"	P4"	Separated into 5 positions (P2 - 4)

The factory set position is standard position.

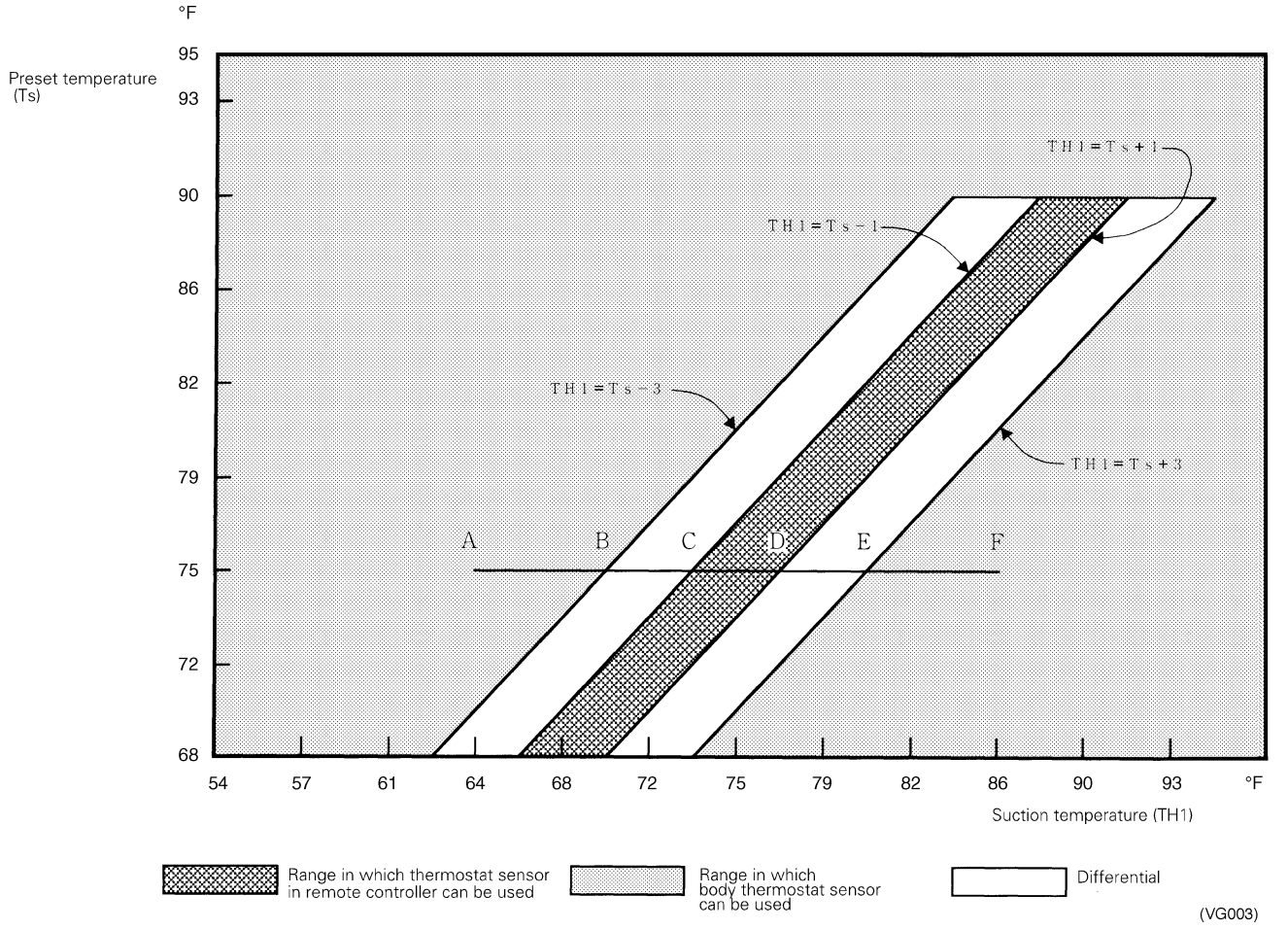
(VL012)

9.3 Thermostat Sensor in Remote Controller

Temperature is controlled by both the thermostat sensor in remote controller and air suction thermostat in the indoor unit. (This is however limited to when the field setting for the thermostat sensor in remote controller is set to “Use”.)

Cooling

If there is a significant difference in the preset temperature and the suction temperature, fine adjustment control is carried out using a body thermostat sensor, or using the sensor in the remote controller near the position of the user when the suction temperature is near the preset temperature.



■ **Ex: When cooling**

Assuming the preset temperature in the figure above is 75°F, and the suction temperature has changed from 64°F to 86°F (A → F):

(This example also assumes there are several other air conditioners, the VRV system is off, and that temperature changes even when the thermostat sensor is off.)

Body thermostat sensor is used for temperatures from 64°F to 73°F (A → C).

Remote controller thermostat sensor is used for temperatures from 73°F to 81°F (C → E).

Body thermostat sensor is used for temperatures from 81°F to 86°F (E → F).

And, assuming suction temperature has changed from 86°F to 64°F (F → A):

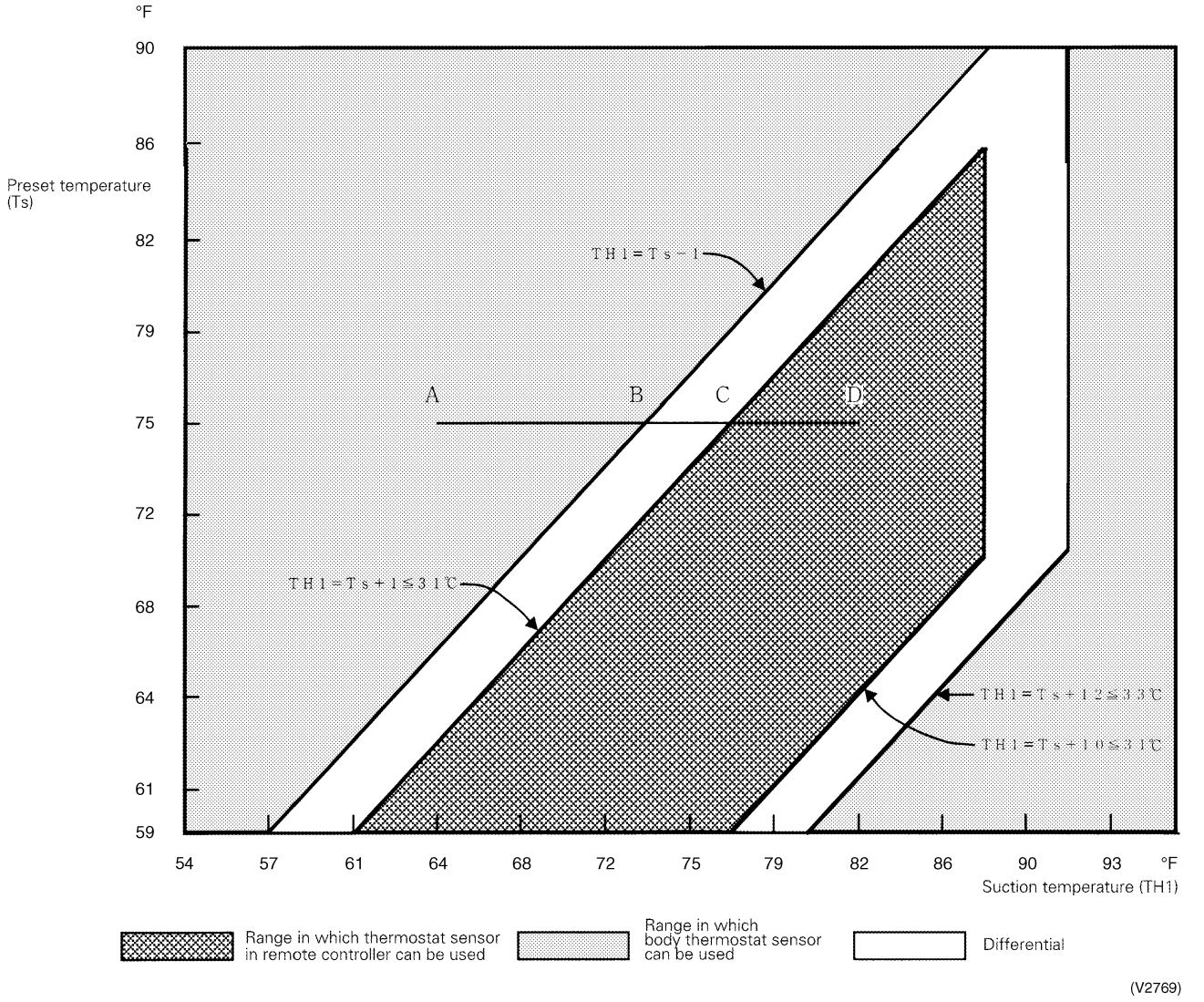
Body thermostat sensor is used for temperatures from 86°F to 77°F (F → D).

Remote controller thermostat sensor is used for temperatures from 77°F to 70°F (D → B).

Body thermostat sensor is used for temperatures from 70°F to 64°F (B → A).

Heating

When heating, the hot air rises to the top of the room, resulting in the temperature being lower near the floor where the occupants are. When controlling by body thermostat sensor only, the unit may therefore be turned off by the thermostat before the lower part of the room reaches the preset temperature. The temperature can be controlled so the lower part of the room where the occupants are doesn't become cold by widening the range in which thermostat sensor in remote controller can be used so that suction temperature is higher than the preset temperature.



(V2769)

■ **Ex: When heating**

Assuming the preset temperature in the figure above is 75°F, and the suction temperature has changed from 64°F to 82°F (A → D):

(This example also assumes there are several other air conditioners, the VRV system is off, and that temperature changes even when the thermostat sensor is off.)

Body thermostat sensor is used for temperatures from 64°F to 77°F (A → C).

Remote controller thermostat sensor is used for temperatures from 77°F to 82°F (C → D).

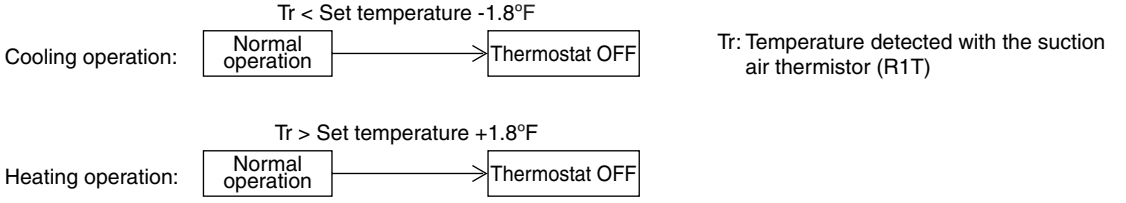
And, assuming suction temperature has changed from 82°F to 64°F (D → A):

Remote controller thermostat sensor is used for temperatures from 82°F to 73°F (D → B).

Body thermostat sensor is used for temperatures from 73°F to 64°F (B → A).

9.4 Thermostat Control While in Normal Operation

VRV multi systems are set at factory to thermostat control mode using the remote controller. While in normal thermostat differential control mode (i.e., factory set mode), the thermostat turns OFF when the system reaches a temperature of -1.8°F from the set temperature while in cooling operation or of +1.8°F from that while in heating operation.

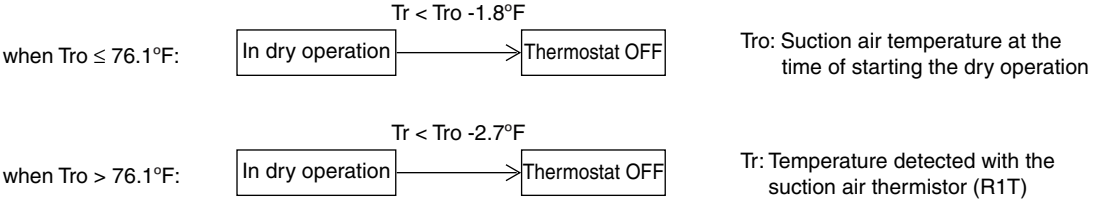


While in a single remote controller group control, the body thermostat is only used from this control. Furthermore, while in heating operation, cassette-mounted indoor units conduct the thermostat control by a value compensated by -3.6°F for the value detected with the body thermostat. (Through field settings, the thermostat differential setting can be changed from 1.8°F to 0.9°F. For details on the changing procedure, refer to information on page onward.)

9.5 Thermostat Control in Dry Operation

While in dry operation, the thermostat control is conducted according to a suction temperature at the time of starting the dry operation.

Assuming that the suction air temperature at the time of starting the dry operation is Tro and the suction air temperature in operation is Tr,



Furthermore, while in dry operation mode, fans operate at L flow rate, stops for a period of six minutes while the thermostat is OFF, and then return to operation at L flow rate. (This control is used to prevent a rise in indoor temperature while in thermostat OFF mode.)

9.6 Electronic expansion Valve Control

• Electronic expansion Valve Control

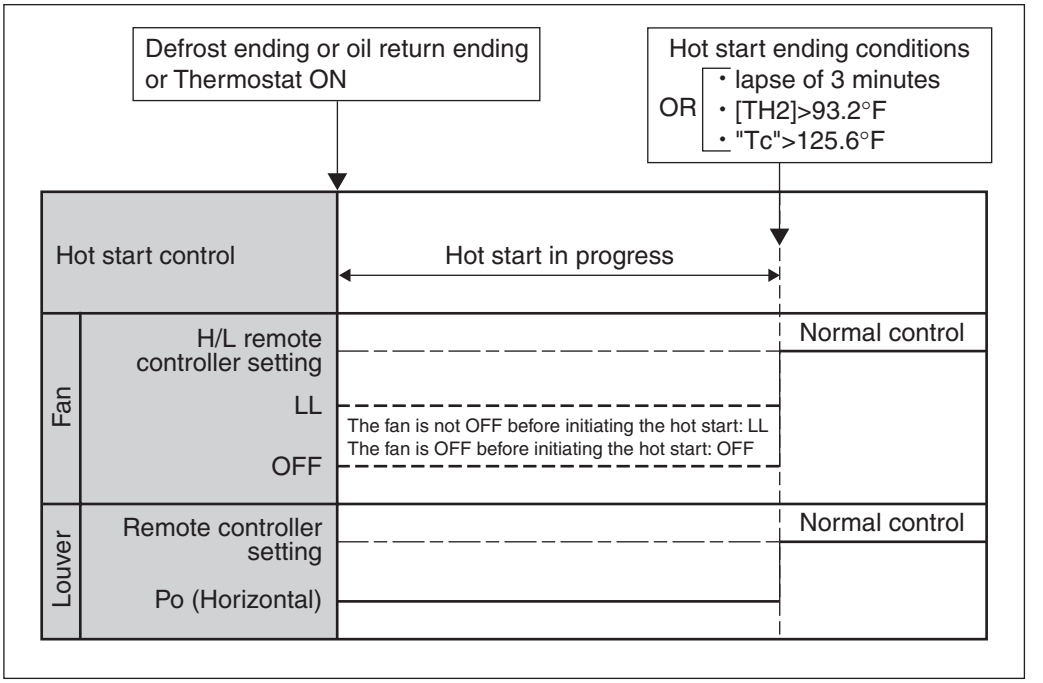
In cooling, to maximize the capacity of indoor unit heat exchanger (evaporator), operate the electronic expansion valve under PI control so that the evaporator outlet superheated degree (SH) will become constant.
In heating, to maximize the capacity of indoor unit heat exchanger (condenser), operate the electronic expansion valve under PI control so that the evaporator outlet superheated degree (Condenser outlet subcooled degree) will become constant.

Cooling SH=TH_1-TH_2	SH : Evaporator outlet superheated degree
(Heating SC=TC-TH_1)	TH_1: Temperature (°F) detected with the liquid thermistor
	TH_2: Temperature (°F) detected with the gas thermistor
	SC : Condenser outlet subcooled degree
	TC : High pressure equivalent saturated temperature

Furthermore, the default value of the optimal evaporator outlet superheated degree (condenser outlet subcooled degree) is 5 deg. However, this default value varies with the operating performance.

9.7 Hot Start Control (In Heating Operation Only)

At startup with thermostat ON or after the completion of defrosting in heating operation, the indoor unit fan is controlled to prevent cold air from blasting out and ensure startup capacity.
[Detail of operation]
When either the **start condition 1** or the **start condition 2** is established, the operations shown below will be conducted.



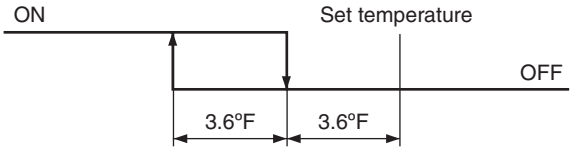
TH_2: Temperature (°F) detected with the gas thermistor
TC : High pressure equivalent saturated temperature

9.8 Heater Control

The heater control is conducted in the following manner.

[Normal control]

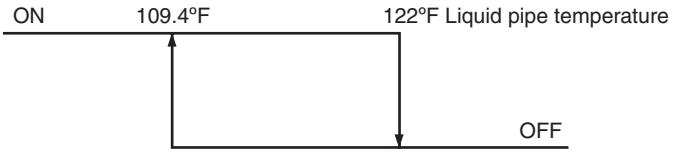
While in heating operation, the heater control (ON/OFF) is conducted as shown on the right.



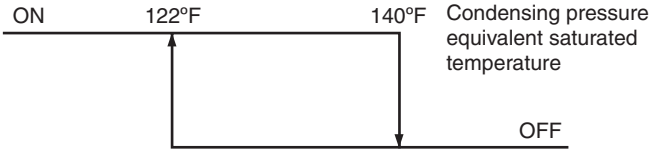
[Overload control]

When the system is overloaded in heating operation, the heater will be turned OFF in the following two manners.

(1) The heater control (ON/OFF) is conducted through the liquid pipe temperature (R2T) of the indoor unit.



(2) The heater control (ON/OFF) is conducted by converting the heater temperature into the condensing pressure equivalent saturated temperature (Tc) according to the temperature detection through the high pressure sensor (SINPH) of the outside unit.



[Fan residual operation]

While the heater turns OFF, in order to prevent the activation of the thermal protector, the fan conducts residual operation for a given period of time after the heater turns OFF. (This operation is conducted regardless of with or without heater equipped.)

Residual operation time = 100 seconds on ceiling suspended type or 60 seconds on other types

9.9 List of Swing Flap Operations

Swing flaps operate as shown in table below.

			Fan	Flap		
				FXFQ	FXHQ	FXAQ
Heating	Hot start from defrosting operation	Swing	OFF	Horizontal	Horizontal	Horizontal
		Wind direction set	OFF	Horizontal	Horizontal	Horizontal
	Defrosting operation	Swing	OFF	Horizontal	Horizontal	Horizontal
		Wind direction set	OFF	Horizontal	Horizontal	Horizontal
	Thermostat OFF	Swing	LL	Horizontal	Horizontal	Horizontal
		Wind direction set	LL	Horizontal	Horizontal	Horizontal
	Hot start from thermostat OFF mode (for prevention of cold air)	Swing	LL	Horizontal	Horizontal	Horizontal
		Wind direction set	LL	Horizontal	Horizontal	Horizontal
	Stop	Swing	OFF	Horizontal	Horizontal	Totally closed
		Wind direction set	OFF	Horizontal	Horizontal	Totally closed
Cooling	Thermostat ON in dry operation using micro computer	Swing	L*1	Swing	Swing	Swing
		Wind direction set	L*1	Set	Set	Set
	Thermostat OFF in dry operation using micro computer	Swing	OFF or L	Swing	Swing	Swing
		Wind direction set		Set	Set	Set
	Thermostat OFF in cooling	Swing	Set	Swing	Swing	Swing
		Wind direction set	Set	Set	Set	Set
	Stop	Swing	OFF	Horizontal	Horizontal	Totally closed
		Wind direction set	OFF	Set	Horizontal	Totally closed
	Micro computer control (including cooling operation)	Swing	L	Swing	Swing	Swing
		Wind direction set	L	Set	Set	Set

*1. L or LL only on FXFQ models

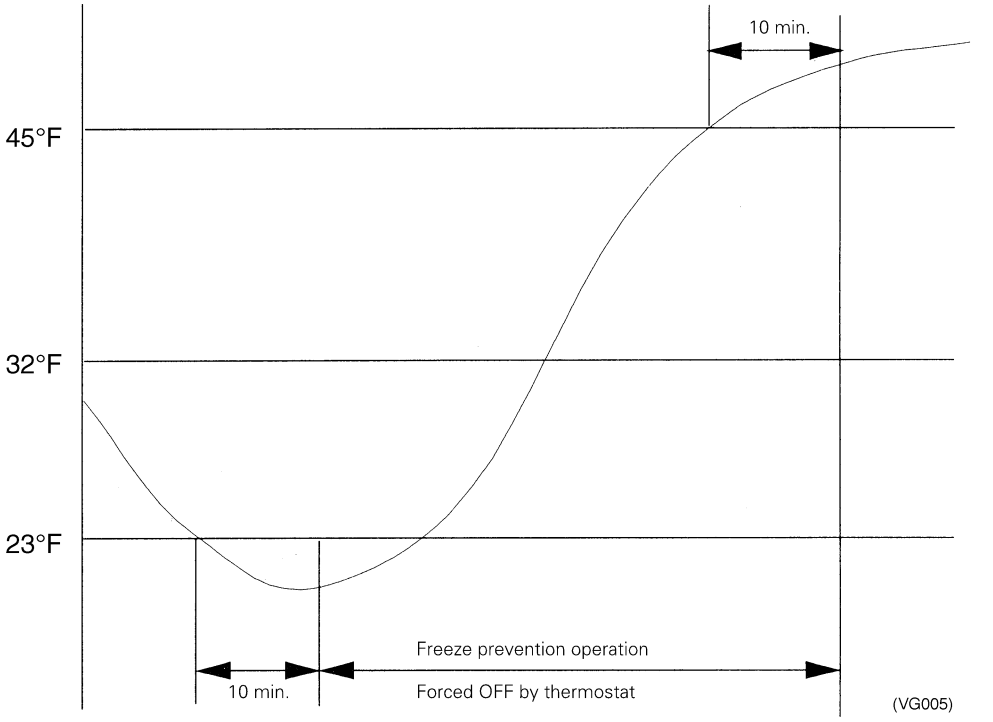
9.10 Freeze Prevention

Freeze Prevention by Off Cycle (Indoor Unit)

When the temperature detected by liquid pipe temperature thermistor (R2T) of the indoor unit heat exchanger drops too low, the unit enters freeze prevention operation in accordance with the following conditions, and is also set in accordance with the conditions given below.

Conditions for starting freeze prevention: Temperature is 30°F or less for total of 40 min., or temperature is 23°F or less for total of 10 min.
Conditions for stopping freeze prevention: Temperature is 45°F or more for 10 min. continuously

Ex: Case where temperature is 23°F or less for total of 10 min.



Part 5
Test Operation

1. Test Operation 94
   1.1 Procedure and Outline 94
2. Outside Unit PC Board Layout 98
3. Field Setting 99
   3.1 Field Setting from Remote Controller 99
   3.2 Field Setting from Outside Unit 110

1. Test Operation

1.1 Procedure and Outline

Follow the following procedure to conduct the initial test operation after installation.

1.1.1 Check Work Prior to Turn Power Supply On

Check the below items.
- Power wiring
- Control transmission wiring between units
- Operation signal to heat source pump and interlock wiring from pump
- Interlock circuit
- Earth wire

○ Is the wiring performed as specified?
○ Are the designated wires used?
○ Is the grounding work completed?
Use a 500V megger tester to measure the insulation.
- Do not use a megger tester for other circuits than 200V (or 240V) circuit.

○ Are the setscrews of wiring not loose?

⇩

Check on refrigerant piping, water piping and piping insulation

○ Is pipe size proper? (The design pressure of this product is 580psi.)
○ Are pipe insulation materials installed securely?
Liquid and gas pipes need to be insulated. (Otherwise causes water leak.)
○ Is refrigerant piping carried out correctly as per installation manual?
(Special care is required for multi-outside unit installation.)

⇩

Check on air tight test and vaccume drying

○ Is the air tight test and vaccume drying carried out as per installation manual?

⇩

Check on amount of additional refrigerant charge

○ Is refrigerant charged up to the specified amount?
If insufficient, charge the refrigerant from the service port of stop valve on the liquid side with outside unit in stop mode after turning power on.
○ If the specified amount of refrigerant can not be charged in stop mode, charge the required refrigerant as per “Additional refrigerant charge mode” in operation. (Refer page 129)
○ Has the amount of refrigerant charge been recorded on “Record Chart of Additional Refrigerant Charge Amount”?

⇩

Check on stop valves opening

○ Check to make sure the all stop valves on outside units are open.

(V3055)

1.1.2 Turn Power On

Turn outside unit, indoor unit, BS unit and heat source water pump power on.

○ Be sure to turn the power on 6 hours before starting operation to protect compressors. (to power on clankcase heater)

⇩

Confirm LED display on outside unit’s PCB

○ Make sure the display is normal.
Following table shows correct display.

⇩

Carry out field setting on outside unit PC board

○ For field settings, refer to “Field Settings” on and after P110.
After the completion of field settings, set to “Setting mode 1”.
In case of multi-outside unit connection, carry out the field settings on master unit. (The setting on slave unit is not effective.)

(V3056)

○ON ●OFF ◑Blink

LED display (Factory set)		Micro computer normal monitor	MODE	TEST	CH selection			Low noise	Demand	Multi
					IND	Master	Slave			
		HAP	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
1 outside unit installation		◑	●	●	○	●	●	●	●	●
outside unit multi installation(*)	master	◑	●	●	○	●	●	●	●	○
	slave1	◑	●	●	●	●	●	●	●	◑
	slave2	◑	●	●	●	●	●	●	●	●

* The outside unit connected the control wires (F1 and F2) for the indoor unit should be designated as master unit. The other outside unit not connected the control wires will be slave unit.

1. When Turning On Power First Time

The unit cannot be run for up to 12 minutes to automatically set the master power and address (indoor-outside unit address, etc.).

Status

Outside unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If ON button is pushed during operation described above, the “UH” malfunction indicator blinks. (Returns to normal when automatic setting is complete.)

2. When Turning On Power the Second Time and Subsequent

Tap the RESET button on the outside unit PC board. Operation becomes possible for about 2 minutes. If you do not push the RESET button, the unit cannot be run for up to 10 minutes to automatically set master power.

Status

Outside unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If ON button is pushed during operation described above, the operation lamp lights but the compressor does not operate. (Returns to normal when automatic setting is complete.)

3. When an Indoor Unit or Outside Unit Has Been Added, or Indoor or Outside Unit PC Board Has Been Changed

Be sure to push and hold the RESET button for 5 seconds. If not, the addition cannot be recognized. In this case, the unit cannot be run for up to 12 minutes to automatically set the address (indoor-outside unit address, etc.).

Status

Outside unit	Test lamp H2P .... Blinks Can also be set during operation described above.
Indoor unit	If ON button is pushed during operation described above, the “UH” or “U4” malfunction indicator blinks. (Returns to normal when automatic setting is complete.)

⚠ **Caution When the 400 volt power supply is applyed to “N” phase by mistake, replace Inverter PC board (A2P) and control transformer (T1R, T2R) in switch box together.**

(V0847)

1.1.3 Check Operation

Be sure to conduct the check operation. If the check operation is not conducted, the malfunction code “U3” will be displayed on the remote controller, thus disabling the normal operation. Through the following procedure, the check operation is automatically conducted. A period of approximately 20 minutes (approximately 30 minutes at maximum) is required to complete the judgment.

* For details of the check operation and LED display, refer to information on page 134.

Check Setting mode 1

If the LED “H1P” turns OFF, the system is set to “Setting mode 1”.
If the “H1P” turns ON or OFF, pressing the PAGE FEED button (BS1) will set the system to “Setting mode 1”.

Start check operation.

Press and hold the TEST OPERATION button (BS4) on the outside PC board for a period of 5 seconds or more.

The following check operation is automatically started.

1 Check the erroneous wiring.
2 Check whether or not the stop valve is failed to open.
3 Check the refrigerant for overcharging.
4 Judge the piping length automatically.

∗1. The “H2P” blinks during operation, and “TEST OPERATION” and “UNDER CENTRALIZED CONTROL” are displayed on the remote controller.
∗2. There may be cases where a period of approximately 10 minutes are required for the compressor to start up, which, however, is not a malfunction but used to ensure even refrigerant conditions.
∗3. The check operation will be automatically conducted in cooling mode.
∗4. In order to stop the compressor operation, press the CHECK button (BS3). The compressor will stop after the completion of residual operation for a period of approximately 30 seconds. (The compressor operation cannot be stopped from the remote controller.)

Completion of check operation

After the completion of check operation, check the operation results through the LED displays.

(For normal completion) ● ● ○ ● ● ● ●
(For abnormal completion) ● ○ ○ ● ● ● ●

→Check the malfunction code on the remote controller and then rectify the malfunction according to information in the “Troubleshooting”.

<Precautions for check operation>

· If the test operation is started within approximately 12 minutes after turning ON the power supply to the indoor and outside units, H2P will turn ON and the compressor will not operate. Referring to information in table in 1.1.2 Turning ON power supply (on page 94), check to be sure the LED displays are normal and then operate the compressor.
· For the outside-multi system, an outside unit to which the indoor unit connecting wires are connected serves as the master unit. Be sure to make settings with pushbutton switches on the master unit.
· No malfunctions can be checked on individual indoor unit. After the completion of this test operation, check the individual indoor unit for any malfunctions while in normal operation mode using the remote controller.
· While in check operation mode, the indoor units as well as the outside units start the operation. Do not attempt to conduct the check operation while working on the indoor unit.
· Work with all the outside panels closed except for the switch box.
· While in the test operation, operating sounds such as refrigerant passing sounds or solenoid valve switching sounds may become louder.
· In the case of multi-outside-unit system, make setting on the master unit PC board. (Setting with the slave unit is disabled.)

[LED display in the case of multi-outside-unit system] (Same as that in emergency operation)

* Discriminate the operating status of the master unit/slave units through the following LED display.

LED display (○:ON ●:OFF ◑:Blink)

	H1P	—	—	—	H7P	H8P
Master:	●	●	○	●	●	● ● ○
Slave 1:	●	●	●	●	●	● ● ◑
Slave 2:	●	●	●	●	●	● ● ●

(Factory set)

Malfunction code

In case of an alarm code displayed on remote controller:

Malfunction code	Installation error	Remedial action
E3 E4 F3 F6 UF U2	The shutoff valve of an outside unit is left closed. The cooling water is not provided.	Open the shutoff valve. Check the operation of cooling water pump etc.
U1	The phases of the power to the outside units are reversed.	Exchange two of the three phases (L1, L2, L3) to make a positive phase connection.
U4	No power is supplied to an outside or indoor unit (including phase interruption).	Check if the power wiring for the outside units are connected correctly. (If the power wire is not connected to L2 phase, no malfunction display will appear and the compressor will not work.)
UF	Incorrect transmission between units	Check if the refrigerant piping line and the unit transmission wiring are consistent with each other.
E3 F6 UF U2	Refrigerant overcharge	Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
E4 F3	Insufficient refrigerant	■ Check if the additional refrigerant charge has been finished correctly. ■ Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.
U7 UF	If an outside unit multi terminal is connected when there is one outside unit installed	Remove the line from the outside multi terminals (Q1 and Q2).
UF E4	The operation mode on the remote controller was changed before the check operation.	Set the operation mode on all indoor unit remote controllers to “cooling”.
HJ	The heat source water is not circulating.	Make sure that the water pump is running.

1.1.4 Confirmation on Normal Operation

Conduct normal unit operation after the check operation has been completed.

(1) Confirm that the indoor/outdoor units can be operated normally.
(When an abnormal noise due to liquid compression by the compressor can be heard, stop the unit immediately, and turn on the crankcase heater to heat up it sufficiently, then start operation again.)

(2) Operate indoor unit one by one to check that the corresponding outside unit operates.

(3) Confirm that the indoor unit discharges cold air (or warm air).

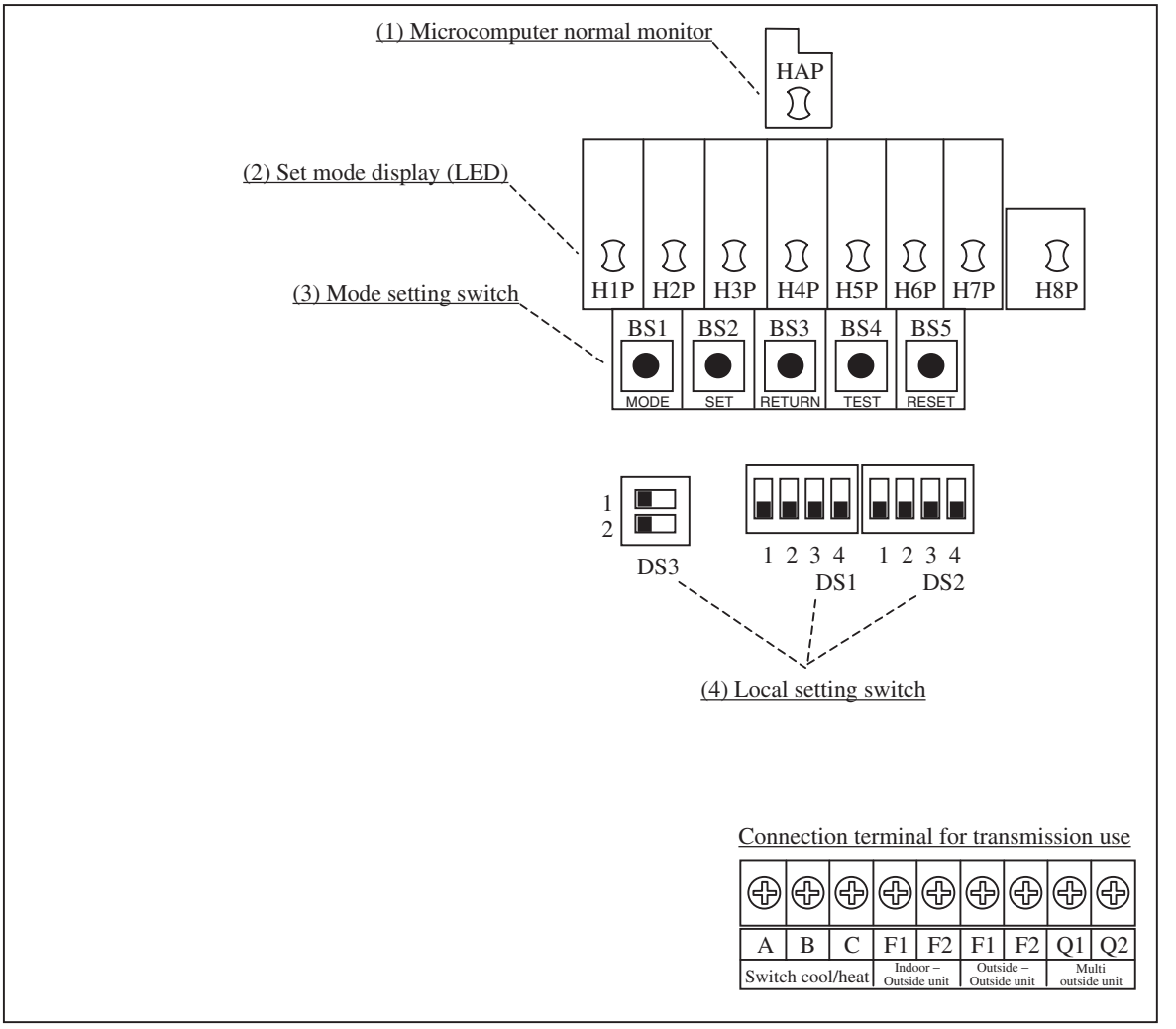
(4) Operate the air direction control button and flow rate control button to check the function of the devices.

<Precautions for checking normal operation>

- **For a period of approximately 5 minutes after the compressor stops, even if the ON/OFF button for the indoor units in one and the same system is pressed, the compressor will not operate.**
- **After stopping the compressor operation using the remote controller, the outside unit may conduct the residual operation for a period of 5 minutes at maximum.**
- **When the check operation is not conducted using the TEST OPERATION button at the first test operation after installation, the malfunction code “U3” will be displayed. Be sure to conduct the check operation according to 1.1.3 Check Operation.**

2. Outside Unit PC Board Layout

Outside unit PC board



(V3054)

(1) Microcomputer normal monitor
This monitor blinks while in normal operation, and turns on or off when a malfunction occurs.

(2) Set mode display (LED)
LEDs display mode according to the setting.

(3) Mode setting switch
Used to change mode.

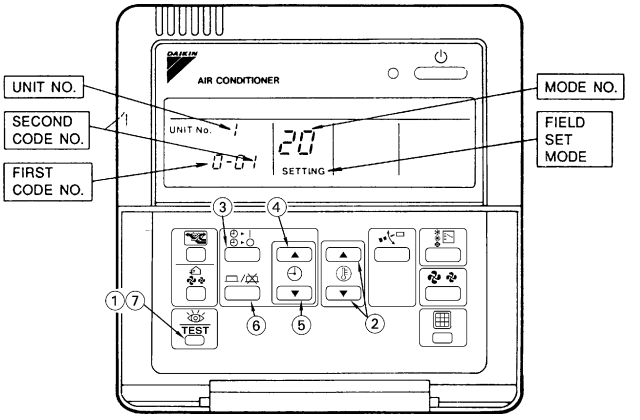
(4) Local setting switch
Used to make local settings.

3. Field Setting

3.1 Field Setting from Remote Controller

Individual function of indoor unit can be changed from the remote controller. At the time of installation or after service inspection / repair, make the local setting in accordance with the following description.
Wrong setting may cause malfunction.
(When optional accessory is mounted on the indoor unit, setting for the indoor unit may be required to change. Refer to information in the option handbook.)

3.1.1 Wired Remote Controller <BRC1C71>



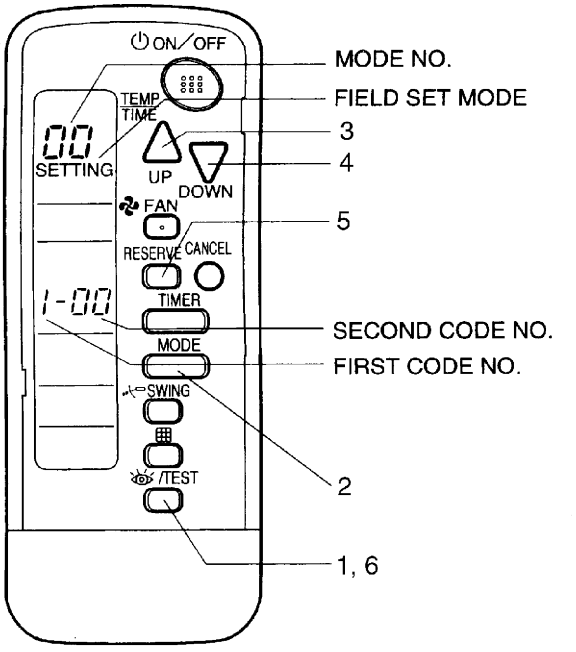
2P068938-1

1. When in the normal mode, push the TEST button for 4 seconds or more, and operation then enters the “field set mode”.
2. Select the desired “mode No.” with the button.
3. During group control and you want to set by each individual indoor unit (when mode No. 20, 21, 22, 23, 25 has been selected), push the time mode button and select the “indoor unit No.” to be set.
   Note: This operation is not required when setting as a group.
4. Push the button and select the first code No.
5. Push the button and select the second code No.
6. Push the timer button one time and “define” the currently set contents.
7. Push the TEST button to return to the normal mode.

(Example)
When setting the filter sign time to “Filter Dirtiness-High” in all group unit setting, set the Mode No. to “10”, Mode setting No. to “0” and setting position No. to “02”.

3.1.2 Wireless Remote Controller - Indoor Unit

BRC7C812
BRC4C82
BRC7E818
BRC7E83



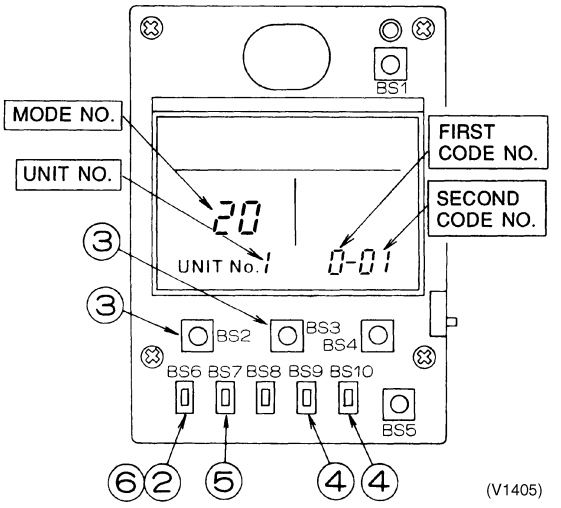
(V2770)

1. When in the normal mode, push the /TEST button for 4 seconds or more, and operation then enters the “field set mode”.
2. Select the desired “mode No.” with the MODE button.
3. Pushing the UP button, select the first code No.
4. Pushing the DOWN button, select the second code No.
5. Push the timer RESERVE button and check the settings.
6. Push the /TEST button to return to the normal mode.

(Example)
When setting the filter sign time to “Filter Dirtiness-High” in all group unit setting, set the Mode No. to “10”, Mode setting No. to “0” and setting position No. to “02”.

3.1.3 Simplified Remote Controller

BRC2A71



■ Group No. setting by simplified remote controller.

1. Remove the cover of remote controller.
2. While in normal mode, press the [BS6] BUTTON (field set) to enter the FIELD SET MODE.
3. Select the mode No. [00] with [BS2] BUTTON (temperature setting ▲) and [BS3] BUTTON (temperature setting ▼).
4. Select the group No. with [BS9] BUTTON (set A) and [BS10] BUTTON (set B). (Group Nos. increase in the order of 1-00, 1-01.....1-15, 2-00,.....4-15. However, the unified ON/OFF controller displays only group No. set within the range of control.)
5. Press [BS7] BUTTON (set/cancel) to set group No.
6. Press [BS6] BUTTON (field set) to return to the NORMAL MODE.

3.1.4 Setting Contents and Code No. – VRV Indoor Unit

VRV system indoor unit settings	Mode No. Note 2	Setting Switch No.	Setting Contents		Second Code No.(Note 3) 01		02		03		04	
	10(20)	0	Filter contamination heavy/ light (Setting for display time to clean air filter) (Sets display time to clean air filter to half when there is heavy filter contamination.)	Super long life filter	Light	Approx. 10,000 hrs.	Heavy	Approx. 5,000 hrs.	—		—	
				Long life filter		Approx. 2,500 hrs.		Approx. 1,250 hrs.				
				Standard filter		Approx. 200 hrs.		Approx. 100 hrs.				
		1	Long life filter type		Long life filter		Ultra long life filter		—		—	
		2	Thermostat sensor in remote controller		Use		No use		—			
		3	Display time to clean air filter calculation (Set when filter sign is not to be displayed.)		Display		No display		—			
	12(22)	0	Optional accessories output selection (field selection of output for adaptor for wiring)		Indoor unit turned ON by thermostat				Operation output		Malfunction output	
		1	ON/OFF input from outside (Set when ON/OFF is to be controlled from outside.)		Forced OFF		ON/OFF control		External protection device input		—	
		2	Thermostat differential changeover (Set when remote sensor is to be used.) Note6		2°F		1°F		—		—	
		3	OFF by thermostat fan speed		LL		Set fan speed		—		—	
		4	Automatic mode differential (automatic temperature differential setting for VRV system heat recovery series cool/heat)		01:0	02:1	03:2	04:3	05:4	06:5	07:6	08:7
		5	Power failure automatic reset		Not equipped		Equipped		—		—	
	13(23)	0	High air outlet velocity (Set when installed in place with ceiling higher than 2.7 m.)		N		H		S		—	
		1	Selection of air flow direction (Set when a blocking pad kit has been installed.)		F (4 directions)		T (3 directions)		W (2 directions)		—	
		3	Air flow direction adjustment (Set at installation of decoration panel.)		Equipped		Not equipped				—	
		4	Field set air flow position setting		Draft prevention		Standard		Ceiling Soiling prevention		—	
		5	Field set fan speed selection (fan speed control by air discharge outlet for phase control)		Standard		Optional accessory 1		Optional accessory 2		—	
	15(25)	1	Thermostat OFF excess humidity		Not equipped		Equipped		—		—	
		2	Direct duct connection (when the indoor unit and heat reclaim ventilation unit are connected by duct directly.) ∗Note 6		Not equipped		Equipped		—		—	
		3	Drain pump humidifier interlock selection		Not equipped		Equipped		—		—	
		5	Field set selection for individual ventilation setting by remote controller		Not equipped		Equipped		—		—	
		6	Field set selection for individual ventilation setting by remote controller		Not equipped		Equipped		—		—	

Note:

1. Settings are made simultaneously for the entire group, however, if you select the mode No. inside parentheses, you can also set by each individual unit. Setting changes however cannot be checked except in the individual mode for those in parentheses.
2. The mode numbers inside parentheses cannot be used by wireless remote controllers, so they cannot be set individually. Setting changes also cannot be checked.
3. Marked ▭ are factory set.
4. Do not make settings other than those described above. Nothing is displayed for functions the indoor unit is not equipped with.
5. “88” may be displayed to indicate the remote controller is resetting when returning to the normal mode.
6. This setting is only applicable to FXFQ and FXHQ type.
7. If the setting mode to “Equipped”, heat reclaim ventilation fan conducts the fan residual operation by linking to indoor unit.

3.1.5 Applicable range of Field setting

	Ceiling mounted cassette type Multi flow	Slim Ceiling mounted duct type	Ceiling mounted built-in type	Ceiling mounted duct type	Ceiling Suspended type	Wall mounted type	Floor standing type	Concealed Floor standing type
	FXFQ		FXSQ	FXMQ	FXHQ	FXAQ	FXLQ	FXNQ
Filter sign	○	○	○	○	○	○	○	○
Ultra long life filter sign	○	—	—	—	—	—	—	—
Remote controller thermostat sensor	○	○	○	○	○	○	○	○
Set fan speed when thermostat OFF	○	○	○	○	○	○	○	○
Air flow adjustment Ceiling height	○	—	—	—	○	—	—	—
Air flow direction	○	—	—	—	—	—	—	—
Air flow direction adjustment (Down flow operation)	—	—	—	—	—	—	—	—
Air flow direction adjustment range	○	—	—	—	—	—	—	—
Field set fan speed selection	○	○*1	—	—	○	—	—	—

*1 Static pressure selection

3.1.6 Detailed Explanation of Setting Modes

Filter Sign Setting

If switching the filter sign ON time, set as given in the table below.

Set Time

Filter Specs. / Setting	Standard	Long Life	Ultra Long Life Filter
Contamination Light	200 hrs.	2,500 hrs.	10,000 hrs.
Contamination Heavy	100 hrs.	1,250 hrs.	5,000 hrs.

Ultra-Long-Life Filter Sign Setting

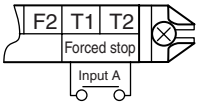
When a Ultra-long-life filter is installed, the filter sign timer setting must be changed.

Setting Table

Mode No.	Setting Switch No.	Setting Position No.	Setting
10 (20)	1	01	Long-Life Filter
		02	Ultra-Long-Life Filter (1)
		03	—

External ON/OFF input

This input is used for “ON / OFF operation” and “Protection device input” from the outside. The input is performed from the T1-T1 terminal of the operation terminal block (X1A) in the electric component box.



Setting Table

Mode No.	Setting Switch No.	Setting Position No.	Operation by input of the signal A
12 (22)	1	01	ON: Forced stop (prohibition of using the remote controller) OFF: Permission of using the remote controller
		02	OFF → ON: Permission of operation ON → OFF: Stop
		03	ON: Operation OFF: The system stops, then the applicable unit indicates “A0”. The other indoor units indicate “U9”.

Fan Speed Changeover When Thermostat is OFF

By setting to “Set Fan Speed”, you can switch the fan speed to the set fan speed when the heating thermostat is OFF.

∗ Since there is concern about draft if using “fan speed up when thermostat is OFF”, you should take the setup location into consideration.

Setting Table

Mode No.	First Code No.	Second Code No.	Setting
12 (22)	3	01	LL Fan Speed
		02	Set Fan Speed

Auto Restart after Power Failure Reset

For the air conditioners with no setting for the function (same as factory setting), the units will be left in the stop condition when the power supply is reset automatically after power failure reset or the main power supply is turned on again after once turned off. However, for the air conditioners with the setting, the units may start automatically after power failure reset or the main power supply turned on again (return to the same operation condition as that of before power failure).

For the above reasons, when the unit is set enabling to utilize “Auto restart function after power failure reset”, utmost care should be paid for the occurrence of the following situation.

Caution

1. **The air conditioner starts operation suddenly after power failure reset or the main power supply turned on again. Consequently, the user might be surprised (with question for the reason why).**
2. **In the service work, for example, turning off the main power switch during the unit is in operation, and turning on the switch again after the work is completed start the unit operation (the fan rotates).**

Air Flow Adjustment - Ceiling height

Make the following setting according to the ceiling height. The setting position No. is set to “01” at the factory.

■ **In the Case of FXAQ07~24, FXHQ12~36**

Mode No.	Setting Switch No.	Setting Position No.	Setting
13 (23)	0	01	Wall-mounted type: Standard
		02	Wall-mounted type: Slight increase
		03	Wall-mounted type: Normal increase

■ **In the Case of FXFQ12~36**

Mode No.	First code No.	Second code No.	Setting	Ceiling height		
				4-way Outlets	3-way Outlets	2-way Outlets
13 (23)	0	01	Standard (N)	Lower than 2.7 m	Lower than 3.0 m	Lower than 3.5 m
		02	High Ceiling (H)	Lower than 3.0 m	Lower than 3.3 m	Lower than 3.8 m
		03	Higher Ceiling (S)	Lower than 3.5 m	Lower than 3.5 m	—

Air Flow Direction Setting

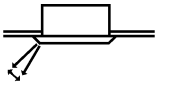
Set the air flow direction of indoor units as given in the table below. (Set when optional air outlet blocking pad has been installed.) The second code No. is factory set to “01”.

Setting Table

Mode No.	First Code No.	Second Code No.	Setting
13 (23)	1	01	F : 4-direction air flow
		02	T : 3-direction air flow
		03	W : 2-direction air flow

Setting of Air Flow Direction Adjustment Range

Make the following air flow direction setting according to the respective purpose.



(S2537)

Setting Table

Mode No.	First Code No.	Second Code No.	Setting
13 (23)	4	01	Upward (Draft prevention)
		02	Standard
		03	Downward (Ceiling soiling prevention)

Air Flow Rate Switching at Discharge Grille for Field Air Flow Rate Switching

When the optional parts (high performance filter, etc.) is installed, sets to change fan speed for securing air flow rate.

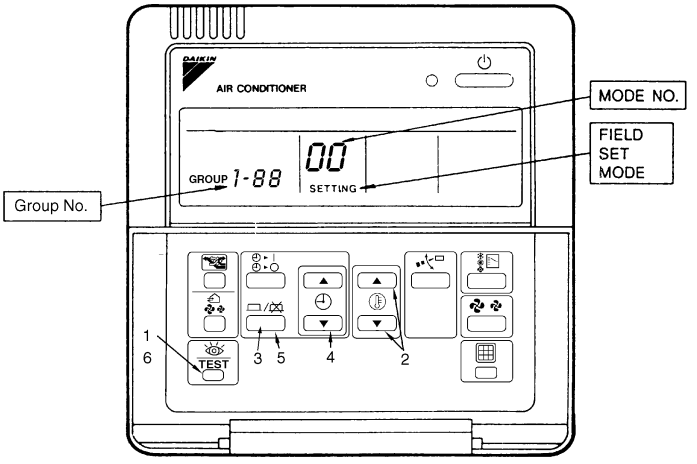
Follow the instruction manual for the optional parts to enter the setting numbers.

3.1.7 Centralized Control Group No. Setting

BRC1C Type

- If carrying out centralized control by central remote controller or unified ON/OFF controller, group No. must be set for each group individually by remote controller.
- Group No. setting by remote controller for centralized control

1. When in the normal mode, push the TEST button for 4 seconds or more, and operation then enters the “field setting mode”.
2. Set mode No. “00” with the button. *
3. Push the button to inspect the group No. display.
4. Set the group No. for each group with the button (The group No. increases in the manner of 1-00, 1-01, ..., 1-15, 2-00, ...4-15. However, the unified ON/OFF controller displays only the group No. within the range selected by the switch for setting each address.)
5. Push the timer button to define the selected group No.
6. Push the TEST button to return to the normal mode.



(S1095)

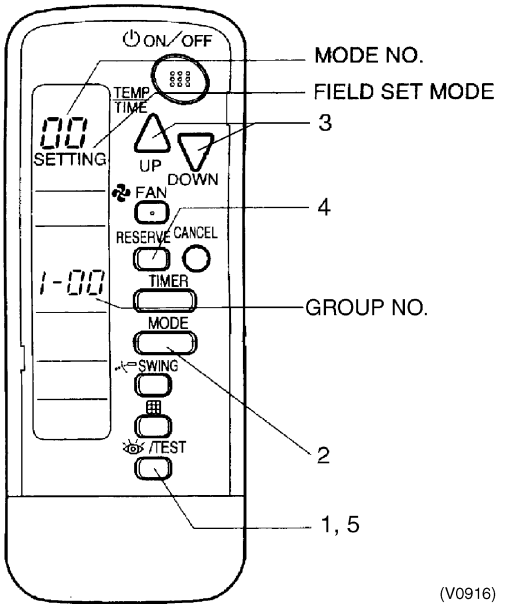
- Even if not using a remote controller, connect the remote controller when setting the group No., set the group No. for centralized control, and disconnect after making the setting.
- Set the group No. after turning on the power supply for the central remote controller, unified ON/OFF controller, and indoor unit.

BRC7C Type
BRC4C Type
BRC7E Type

■ Group No. setting by wireless remote controller for centralized control

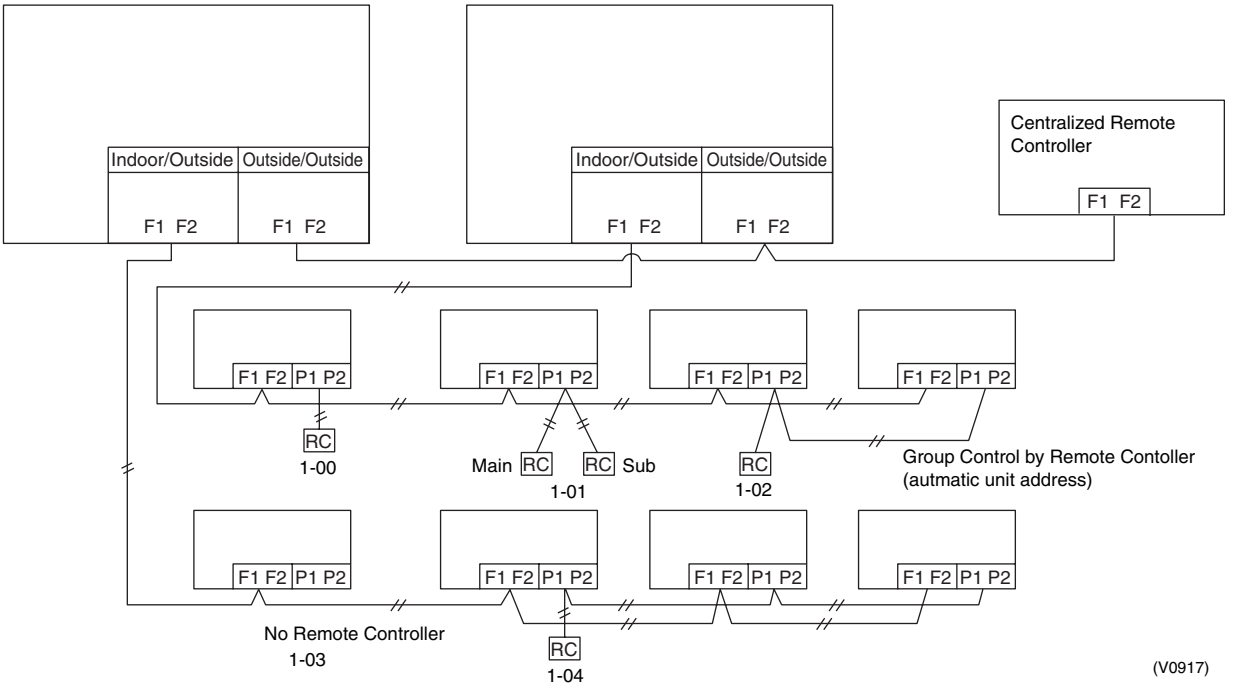
1. When in the normal mode, push /TEST button for 4 seconds or more, and operation then enters the "field set mode".
2. Set mode No. "00" with MODE button.
3. Set the group No. for each group with UP DOWN button (advance/backward).
4. Enter the selected group numbers by pushing RESERVE button.
5. Push /TEST button and return to the normal mode.

BRC7C Type



(V0916)

Group No. Setting Example



(V0917)

Caution When turning the power supply on, the unit may often not accept any operation while "88" is displaying after all indications were displayed once for about 1 minute on the liquid crystal display. This is not an operative fault.

3.1.8 Setting of Operation Control Mode from Remote Controller (Local Setting)

The operation control mode is compatible with a variety of controls and operations by limiting the functions of the operation remote controller. Furthermore, operations such as remote controller ON/OFF can be limited in accordance with the combination conditions. (Refer to information in the table below.)

Centralized controller is normally available for operations. (Except when centralized monitor is connected)

3.1.9 Contents of Control Modes

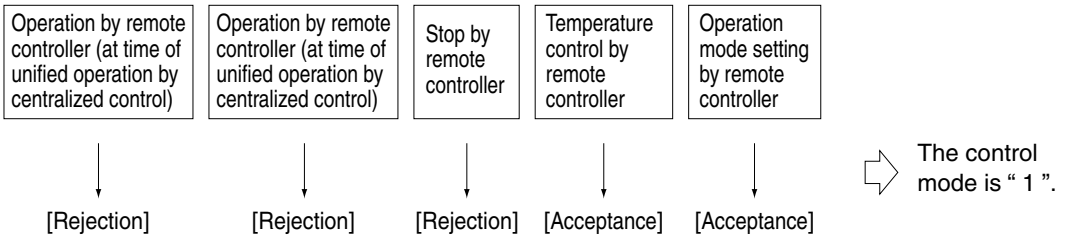
Twenty modes consisting of combinations of the following five operation modes with temperature and operation mode setting by remote controller can be set and displayed by operation modes 0 through 19.

- ON/OFF control impossible by remote controller
  Used when you want to turn ON/OFF by central remote controller only.
  (Cannot be turned on/off by remote controller.)
- OFF control only possible by remote controller
  Used when you want to turn on by central remote controller only, and off by remote controller only.
- Centralized
  Used when you want to turn on by central remote controller only, and turn on/off freely by remote controller during set time.
- Individual
  Used when you want to turn ON/OFF by both central remote controller and remote controller.
- Timer operation possible by remote controller
  Used when you want to turn ON/OFF by remote controller during set time and you do not want to start operation by central remote controller when time of system start is programmed.

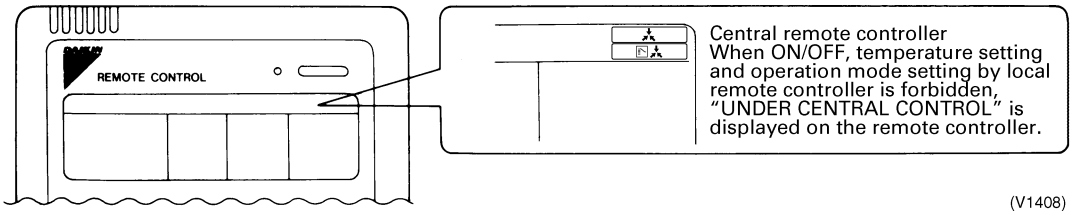
Selection of Control Mode No.

Select whether to accept or to reject the operation from the remote controller regarding the operation, stop, temperature setting and operation mode setting, respectively, and determine the particular control mode from the rightmost column of the table below.

(Example)



Operation mode	Control by remote controller					Control mode
	Operation		Stop	Temperature control	Operation mode setting	
	Unified operation, individual operation by central remote controller, or operation controlled by timer	Unified stop, individual stop by central remote controller, or timer stop				
ON/OFF control impossible by remote controller	Rejection (Example)	Rejection (Example)	Rejection (Example)	Rejection	Acceptance	0
					Rejection	10
				Acceptance (Example)	Acceptance (Example)	1 (Example)
					Rejection	11
Only OFF control possible by remote controller			Acceptance	Rejection	Acceptance	2
					Rejection	12
				Acceptance	Acceptance	3
					Rejection	13
Centralized	Acceptance			Rejection	Acceptance	4
					Rejection	14
				Acceptance	Acceptance	5
					Rejection	15
Individual		Acceptance		Rejection	Acceptance	6
					Rejection	16
				Acceptance	Acceptance	7
					Rejection	17
Timer operation possible by remote controller	Acceptance (During timer at ON position only)	Rejection (During timer at OFF position)		Rejection	Acceptance	8
					Rejection	18
				Acceptance	Acceptance	9
					Rejection	19



(V1408)

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3.2 Field Setting from Outside Unit

3.2.1 Field Setting from Outside Unit

■ **Setting by dip switches**

The following field settings are made by dip switches on PC board.

Dipswitch		Setting item	Description
No.	Setting		
DS1-1	ON	Cool/Heat select	Used to set cool/heat select by remote controller equipped with outside unit.
	OFF (Factory set)		
DS1-2 ~DS1-4	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		
DS2-1 ~4	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		
DS3-1, 2	ON	Not used	Do not change the factory settings.
	OFF (Factory set)		

Caution

DIP switch Setting after changing the main P.C.Board (A1P) to spare parts P.C.B.

When you change the main P.C.Board (A1P) to spare parts P.C.B., please carry out the following setting.

DIP Switch Detail

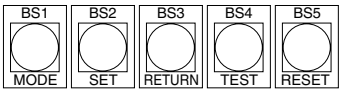
DS No.	Item	Contents	
DS1-1	—	—	
DS1-2	Domestic/Overseas setting	ON	Domestic Japan 200V (Mainly for domestic Japan)
		OFF	Overseas 400V (Mainly for overseas)
DS1-3	—	—	
DS1-4	—	—	
DS2-1	Domestic/Overseas setting	ON	Overseas
		OFF	Domestic Japan
DS2-2	HP setting (Horse power)	60, 72, 84	
DS2-3		DS2-2	OFF
DS2-4		DS2-3	ON
		DS2-4	OFF

■ Setting by pushbutton switches

The following settings are made by pushbutton switches on PC board.
In case of multi-outside unit system, various items should be set with the master unit.
(Setting with the slave unit is disabled.)
The master unit and slave unit can be discriminated with the LED indication as shown below.

	H1P	H2P	H3P	H4P	H5P	H6P	H7P	H8P
Master unit	●	●	○	●	●	●	●	○
Slave unit 1	●	●	●	●	●	●	●	◑
Slave unit 2	●	●	●	●	●	●	●	●

(Factory setting)



(V2760)

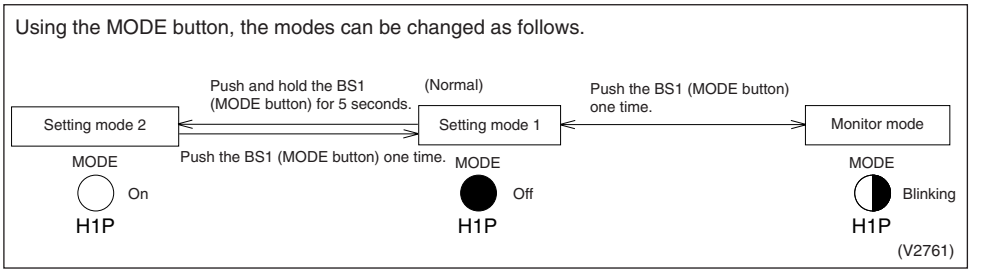
There are the following three setting modes.

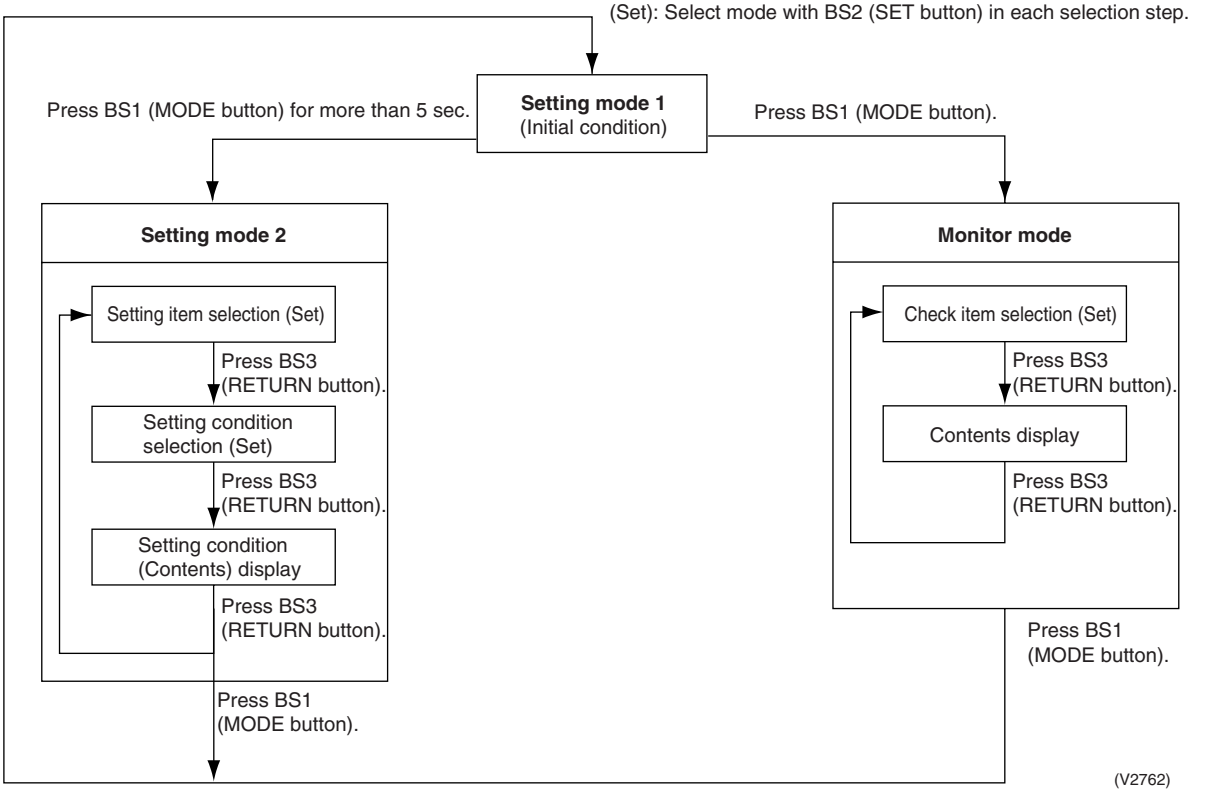
① **Setting mode 1 (H1P off)**
Initial status (when normal) : Used to select the cool/heat setting. Also indicates during “abnormal”, “low noise control” and “demand control”.

② **Setting mode 2 (H1P on)**
Used to modify the operating status and to set program addresses, etc. Usually used in servicing the system.

③ **Monitor mode (H1P blinks)**
Used to check the program made in Setting mode 2.

■ Mode changing procedure





a. “Setting mode 1”

“Normally, “Setting mode 1” is set.
In case of other status, push MODE button (BS1) one time and set to “Setting mode 1”.

<Selection of setting items>

Push the SET button (BS2) and set LED display to a setting item you want.

- Regarding setting item No. 1, 5 only the present status is displayed. For the respective description, refer to the table shown on lower right.
- The cool/heat selection setting can be changed on setting item 2, 3, 4.
  → After setting, push the RETURN button (BS3) and decide the item.

When the RETURN button (BS3) is pushed, the status becomes the initial status of “Setting mode 1”.

(V2763)

No.	Setting (displaying) item	LED display example						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P
1	Display for malfunction / preparing / test run *	●	●	○	●	●	●	●
2	C/H selector (individual)	●	●	○	●	●	●	●
3	C/H selector (Master)	●	●	●	○	●	●	●
4	C/H selector (Slave)	●	●	●	●	○	●	●
5	Demand operation *	●	●	○	●	●	●	●

* Setting No. 1, 5, 6 are the present status display only.

Display for malfunction/preparing/test-run

Normal	●	●	○	●	●	●	●
Malfunction	●	○	○	●	●	●	●
Preparing/Test-run	●	◑	○	●	●	●	●

Display during demand operation

Normal	●	●	○	●	●	●	●
During demand operation	●	●	○	●	●	●	○

H3P to H5P LED display changes depending on setting No. 2, 3, 4.

○ : ON
● : OFF
◑ : Blinking

b. “Setting mode 2”

Push and hold the MODE button (BS1) for 5 seconds and set to “Setting mode 2”.

<Selection of setting items>

Push the SET button (BS2) and set the LED display to a setting item shown in the table on the right.
↓
Push the RETURN button (BS3) and decide the item. (The present setting condition is blinked.)

<Selection of setting conditions>

Push the SET button (BS2) and set to the setting condition you want.
↓
Push the RETURN button (BS3) and decide the condition.

Push the RETURN button (BS3) and set to the initial status of “Setting mode 2”.

∗ If you become unsure of how to proceed, push the MODE button (BS1) and return to setting mode 1.

(V2764)

No.	Setting item	Description
1	Cool/heat unified address	Sets address for cool/heat unified operation.
2	demand address	Address for demand operation
4	Number of units for sequential starting	Sets the number of units for sequential starting.
5	Indoor unit forced fan H	Allows forced operation of indoor unit fan while unit is stopped. (H tap)
6	Indoor unit forced operation	Allows forced operation of indoor unit.
8	Te setting	Target evaporation temperature for cooling
9	Tc setting	Target condensation temperature for heating
12	External low noise setting / Demand setting	Reception of external low noise or demand signal
13	AIRNET address	Set address for AIRNET.
20	Additional refrigerant charge operation setting	Carries out additional refrigerant charge operation.
21	Refrigerant collection mode setting	Sets to refrigerant collection mode.
26	Interlock abnormal display setting	
28	Power transistor check mode ∗Check after disconnection of compressor wires	Used for trouble diagnosis of DC compressor. Since the waveform of inverter is output without wiring to the compressor, it is convenient to probe whether the trouble comes from the compressor or PC board.
30	Demand setting 1	Changes target value of power consumption when demand control 1 is input.
32	Normal demand setting	Normally enables demand control 1 without external input. (Effective to prevent a problem that circuit breaker of small capacity is shut down due to large load.)

No.	Setting item	Description
38	Emergency operation (Setting for the master unit operation prohibition in multi-outside-unit system)	Used to temporarily prohibit the applicable outside unit from operating should there be any faulty part in multi-outside-unit system. Since the comfortable environment is extremely impaired, prompt replacement of the part is required.
39	Emergency operation (Setting for the slave unit 1 operation prohibition in multi-outside-unit system)	
40	Emergency operation (Setting for the slave unit 2 operation prohibition in multi-outside-unit system)	

No.	Setting item	Setting item display: MODE H1P	TEST H2P	C/H selection: IND H3P	C/H selection: Master H4P	C/H selection: Slave H5P	Low noise H6P	Demand H7P	Setting condition display		✻ Factory set
1	Cool / Heat Unified address	○	●	●	●	●	●	○	Address Binary number (6 digits)	0 1 ~ 31	✻
2	Low noise/demand address	○	●	●	●	●	○	●	Address Binary number (6 digits)	0 1 ~ 31	✻
4	Number of units for sequential starting	○	●	●	●	○	●	●	1 unit 2 units 3 units		
5	Indoor forced fan H	○	●	●	●	○	●	○	Normal operation Indoor forced fan H		✻
6	Indoor forced operation	○	●	●	●	○	○	●	Normal operation Indoor forced operation		✻
8	Te setting	○	●	●	○	●	●	●	High Normal (factory setting) Low		✻
9	Tc setting	○	●	●	○	●	●	○	High Normal (factory setting) Low		✻
10	Defrost setting	○	●	●	○	●	○	●	Quick defrost Normal (factory setting) Slow defrost		✻
12	External low noise/ demand setting	○	●	●	○	○	●	●	External low noise/demand: NO External low noise/demand: YES		✻
13	Airnet address	○	●	●	○	○	●	○	Address Binary number (6 digits)	0 1 ~ 63	✻
20	Additional refrigerant operation setting	○	●	○	●	○	●	●	Refrigerant charging: OFF Refrigerant charging: ON		✻
21	Refrigerant recovery mode setting	○	●	○	●	○	●	○	Refrigerant recovery: OFF Refrigerant recovery: ON		✻
26	Interlock abnormal display setting	○	●	○	○	●	○	●	OFF ON		✻

No.	Setting item display								Setting condition display	
	Setting item	MODE H1P	TEST H2P	C/H selection			Low noise H6P	Demand H7P		✻ Factory set
				IND H3P	Master H4P	Slave H5P				
28	Power transistor check mode	○	●	○	○	○	●	●	OFF ON	○ ● ● ● ● ● ○ ✻ ○ ● ● ● ● ○ ●
30	Demand setting 1	○	●	○	○	○	○	●	60 % demand 70 % demand 80 % demand	○ ● ● ● ● ● ○ ○ ● ● ● ● ○ ● ✻ ○ ● ● ● ○ ● ●
32	Continuous demand setting	○	○	●	●	●	●	●	OFF ON	○ ● ● ● ● ● ○ ✻ ○ ● ● ● ● ○ ●
38	Emergency operation (Master unit with multi-outside-unit system is inhibited to operate.)	○	○	●	●	○	○	●	OFF Master unit operation: Inhibited	○ ● ● ● ● ● ○ ✻ ○ ● ● ● ● ○ ●
39	Emergency operation (Slave unit 1 with multi-outside-unit system is inhibited to operate.)	○	○	●	●	○	○	○	OFF Slave unit 1 operation: Inhibited	○ ● ● ● ● ● ○ ✻ ○ ● ● ● ● ○ ●
40	Emergency operation (Slave unit 2 with multi-outside-unit system is inhibited to operate.)	○	○	●	○	●	●	●	OFF Slave unit 2 operation: Inhibited	○ ● ● ● ● ● ○ ✻ ○ ● ● ● ● ○ ●

c. Monitor mode

To enter the monitor mode, push the MODE button (BS1) when in "Setting mode 1".

<Selection of setting item>

Push the SET button (BS2) and set the LED display to a setting item.

<Confirmation on setting contents>

Push the RETURN button (BS3) to display different data of set items.

Push the RETURN button (BS3) and switches to the initial status of "Monitor mode".

∗ Push the MODE button (BS1) and returns to "Setting mode 1".

(V2765)

No.	Setting item	LED display							Data display
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	
0	Operation/backup operation setting	◑	●	●	●	●	●	●	See below
1	C/H unified address	◑	●	●	●	●	●	○	Lower 6 digits
2	Low noise/demand address	◑	●	●	●	●	○	●	
4	Airnet address	◑	●	●	●	○	●	●	
5	Number of connected indoor units *1	◑	●	●	●	○	●	○	
6	Number of connected BS units	◑	●	●	●	○	○	●	
7	Number of connected zone units (excluding outdoor and BS unit)	◑	●	●	●	○	○	○	
8	Number of outside units *2	◑	●	●	○	●	●	●	
9	Number of connected BS units *3	◑	●	●	○	●	●	○	Lower 4 digits: upper
10	Number of connected BS units *3	◑	●	●	○	●	○	●	Lower 4 digits: lower
11	Number of zone units (excluding outdoor and BS unit)	◑	●	●	○	●	○	○	Lower 6 digits
12	Number of indoor units *4	◑	●	●	○	○	●	●	Lower 4 digits: upper
13	Number of indoor units *4	◑	●	●	○	○	●	○	Lower 4 digits: lower
14	Contents of malfunction (the latest)	○	●	●	○	○	○	●	Malfunction code table
15	Contents of malfunction (1 cycle before)	○	●	●	○	○	○	○	Refer page 150.
16	Contents of malfunction (2 cycle before)	○	●	○	●	●	●	●	
20	Contents of retry (the latest)	○	●	○	●	○	●	●	
21	Contents of retry (1 cycle before)	○	●	○	●	○	●	○	
22	Contents of retry (2 cycle before)	○	●	○	●	○	○	●	

The numbers in the "No." column represent the number of times to press the SET (BS2) button.

*1: Number of indoor units connected
Used to make setting of the number of indoor units connected to an out door unit.

*2: Number of outdoor units connected
Used to make setting of the number of outdoor units connected to DIII-NET that is one of the communication lines.

*3: Number of BS units connected
Used to make setting of the number of BS units connected to DIII-NET that is one of the communication lines.

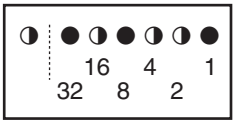
*4: Number of indoor units
Used to make setting of the number of indoor units connected to DIII-NET that is one of the communication lines.
(Only available for VRV indoor units)

Setting item 0 Display contents of "Operation/backup operation setting, and others"

Operation /backup operation setting	ON	◑	●	●	○	●	●	●
	OFF	◑	●	●	●	●	●	●
Te setting	H	◑	●	●	●	●	○	●
	M	◑	●	●	●	●	◑	●
	L	◑	●	●	●	●	●	●
Tc setting	H	◑	●	●	●	●	●	○
	M	◑	●	●	●	●	●	◑
	L	◑	●	●	●	●	●	●

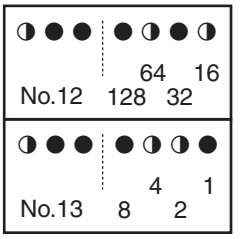
Push the SET button and match with the LEDs No. 1 - 15, push the RETURN button, and enter the data for each setting.

★ Data such as addresses and number of units is expressed as binary numbers; the two ways of expressing are as follows:



The No. 1 cool/heat unified address is expressed as a binary number consisting of the lower 6 digits. (0 - 63)

In ① the address is 010110 (binary number), which translates to 16 + 4 + 2 = 22 (base 10 number). In other words, the address is 22.



The number of terminal blocks for No. 12 and 13 is expressed as an 8-digit binary number, which is the combination of four upper, and four lower digits for No. 12 and 13 respectively. (0 - 128)
In ② the address for No. 12 is 0101, the address for No. 13 is 0110, and the combination of the two is 01010110 (binary number), which translates to 64 + 16 + 4 + 2 = 86 (base 10 number). In other words, the number of terminal block is 86.

★ See the preceding page for a list of data, etc. for No. 0 - 22.

3.2.2 Cool / Heat Mode Switching (In case of heating and simultaneous cooling / heating) operation connection

Set Cool/Heat Separately for Each BS Unit by Cool/Heat Selector.

Set remote controller change over switch (SS1, SS2) as following:

- When using COOL/HEAT selector, turn this switch to the BS side.

NOTE: This setting must be completed before turning power supply ON.

When using cool/heat selector, connect to the terminal A, B and C on the EC of the electric parts box.

EXAMPLE OF TRANSMISSION LINE CONNECTION

- Example of connecting transmission wiring.
  Connect the transmission wirings as shown in the Fig. 1.

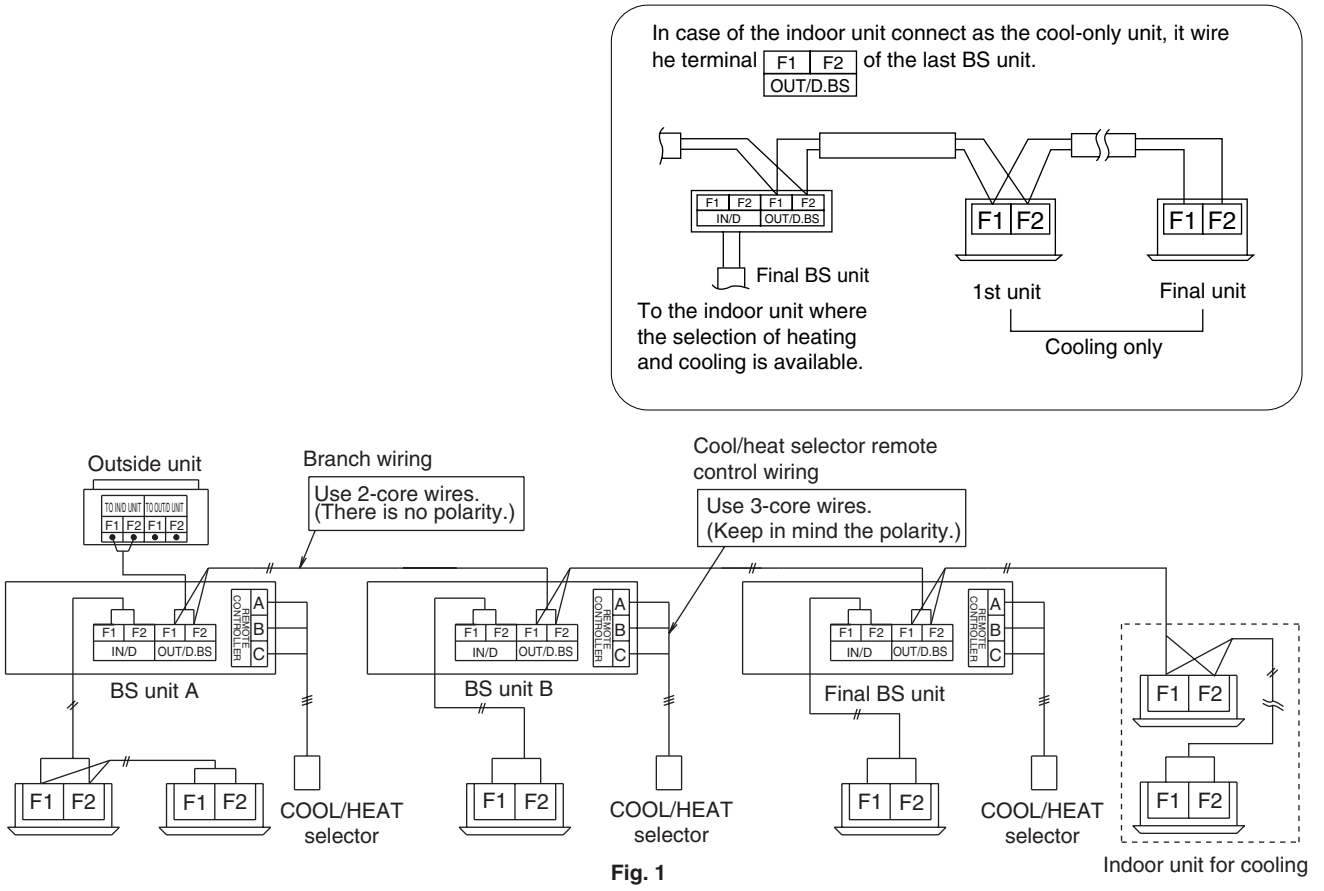


Fig. 1

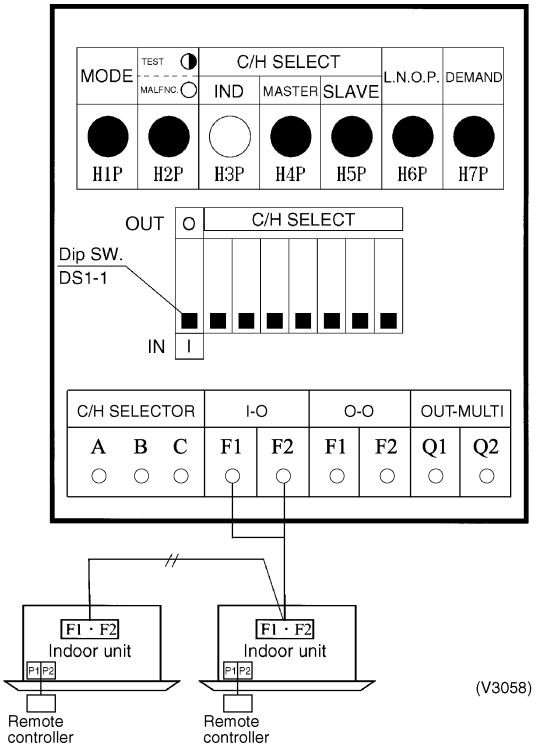
3.2.3 Cool / Heat Mode Switching

There are the following 4 cool/heat switching modes.

① Set cool/heat separately for each outdoor unit system by indoor unit remote controller.
② Set cool/heat separately for each outdoor unit system by cool/heat selector.
③ Set cool/heat for more than one outdoor unit system simultaneously in accordance with unified master outdoor unit by indoor unit remote controller.
④ Set cool/heat for more than one outdoor unit system simultaneously in accordance with unified master outdoor unit by cool/heat switching remote controller.

① Set Cool / Heat Separately for Each Outdoor Unit System by Indoor Unit Remote Controller

- It does not matter whether or not there is outdoor - outdoor unit wiring.
- Set outdoor unit PC board DS1-1 to IN (factory set).
- Set cool/heat switching to IND (individual) for "Setting mode 1" (factory set).
- Set the master unit (= indoor unit having the right to select the cooling/heating operation mode).



<Set the master unit (= indoor unit having the right to select the cooling/heating operation mode).>

In the case of wired remote controllers

- After the check operation, **"CHANGEOVER UNDER CONTROL"** is flashing in all connected remote controllers.
- Select an indoor unit to be used as the master unit in accordance with the request from the customer. (It is recommended to select an indoor unit which will be used most often as the master unit.)
- Press the operation mode selector button in the remote controller of the indoor unit selected as the master unit.
- In that remote controller, **"CHANGEOVER UNDER CONTROL"** disappears. That remote controller will control changeover of the cooling/heating operation mode.
- In other remote controllers, **"CHANGEOVER UNDER CONTROL"** lights.

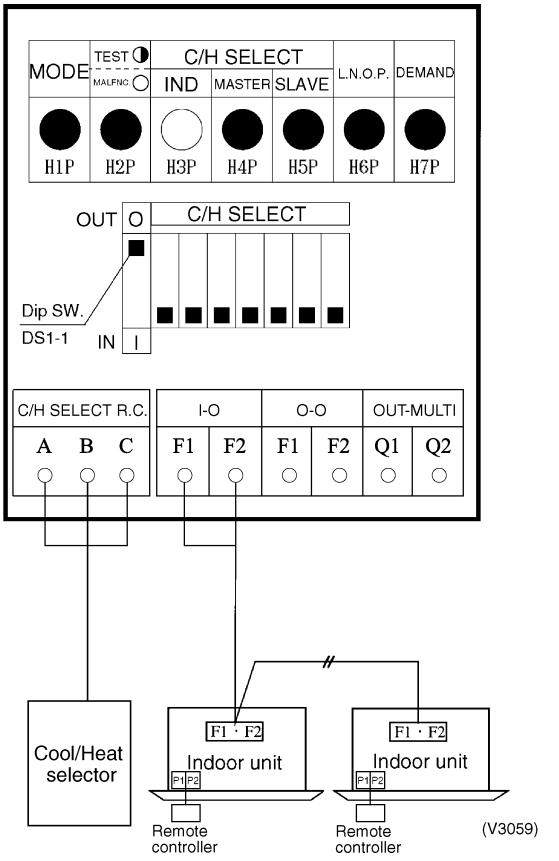
For the details, refer to the installation manual supplied together with the indoor unit.

In the case of wireless remote controllers

- After the check operation, the timer lamp is flashing in all connected indoor units.
- Select an indoor unit to be used as the master unit in accordance with the request from the customer. (It is recommended to select an indoor unit which will be used most often as the master unit.)
- Press the operation selector mode button in the remote controller of the indoor unit selected as the master unit. A "peep" sound is emitted, and the timer lamp turns off in all indoor units.
- That indoor unit will control changeover of the cooling/ heating operation mode.

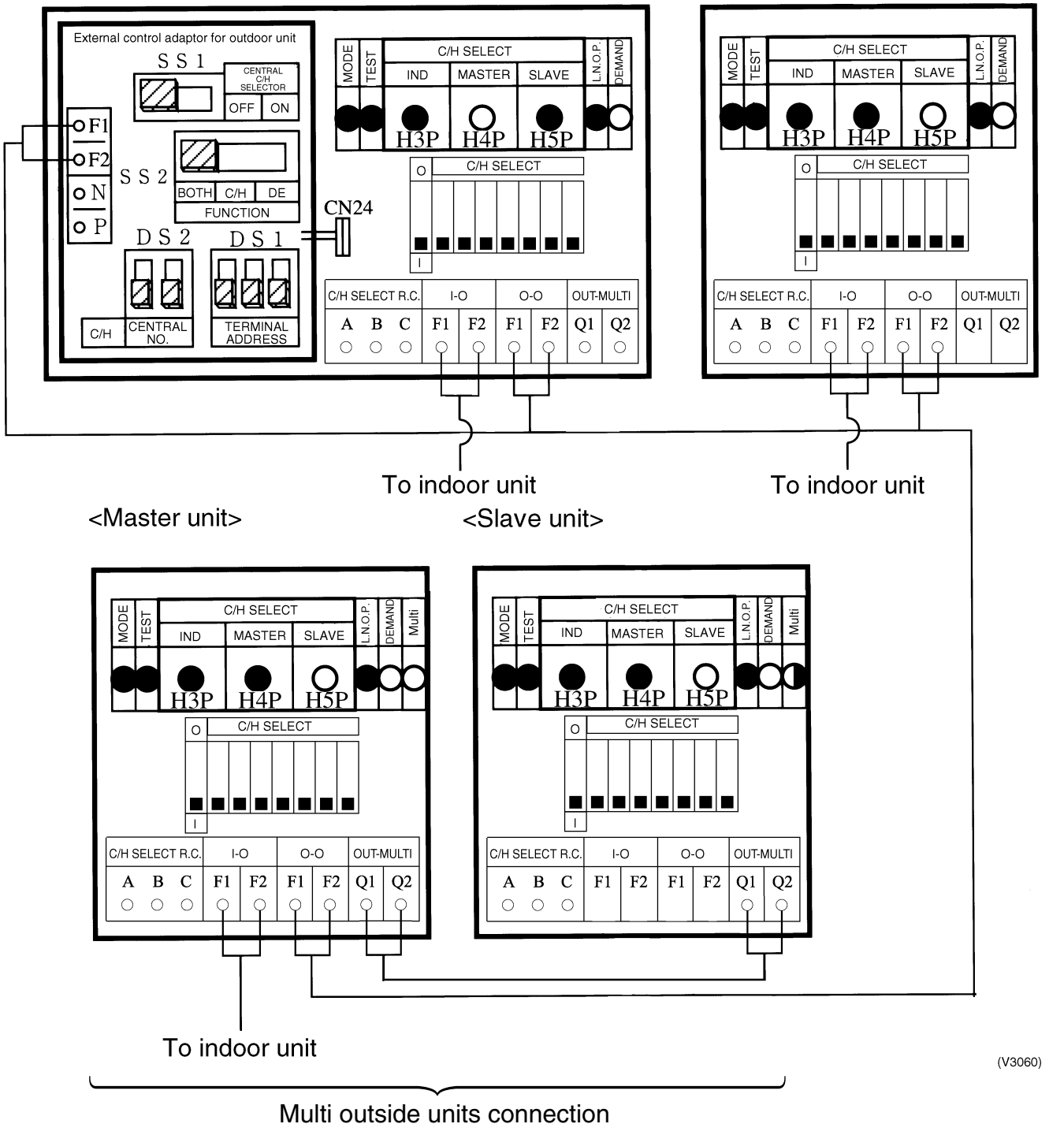
② **Set Cool / Heat Separately for Each Outdoor Unit System by Cool / Heat Selector**

- ◆ It does not matter whether or not there is outdoor - outdoor unit wiring.
- ◆ Set outdoor unit PC board DS1-1 to OUT (factory set).
- ◆ Set cool/heat switching to IND (individual) for “Setting mode 1” (factory set).



③ Set Cool / Heat for More Than One Outside Unit System Simultaneously in Accordance with Unified Master Outside Unit by Indoor Unit Remote Controller

- ◆ Install the outside unit external control adapter on either the outside unit-outside unit, indoor-outside, or transmission line.
- ◆ Set outside unit PC board DS1-1 to “Indoor” (factory set).
- ◆ In setting mode 1, set the outside unit you want to give cool/heat selection permission to as the group master, and set the other outside units as group slave units.
- ◆ Set the outside unit external control adapter SS1 to Unified (factory set) or Cool, and SS2 to No (factory set).



④ Set Cool / Heat for More Than One Outside Unit System Simultaneously in Accordance with Unified Master Outside Unit by Cool/Heat Switching Remote Controller

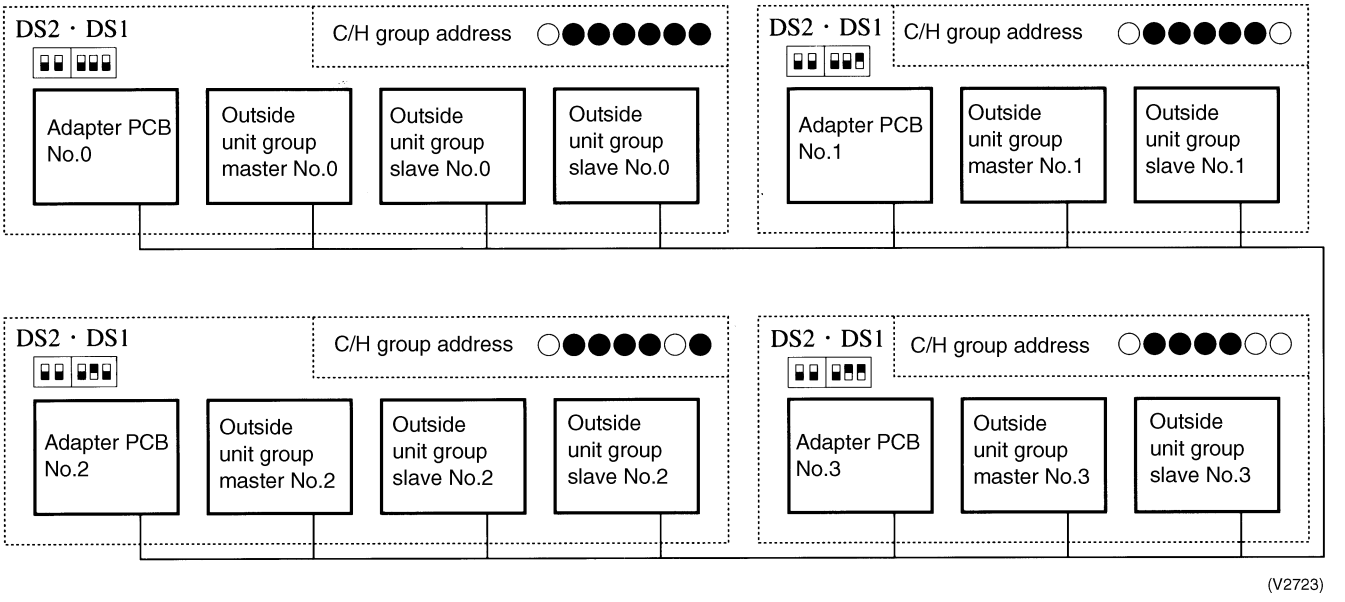
◆ Add and change the following items to ③.

★ Install cool/heat switching remote controller on the group master outside unit.

★ Set SS1 on the group master outside unit PC board.

Supplementation on ③ and ④.

When switching cool/heat for each adapter PC board with the use of more than one adapter PC board, set the address of the adapter PC board DS1 and DS2 so that it matches the unified cool/heat address of outside unit PC board.



(V2723)

Address setting for ③ and ④ (Set lower 5 digits with binary number.) [No.0 to No.31]

Address No.	Outside unit PCB LED Set with setting mode 2	Adapter PCB DS2 DS1
No 0	○ ● ● ● ● ● ● 0	0
No 1	○ ● ● ● ● ● ○ 1	1
No 2	○ ● ● ● ● ○ ● 2	2
No 3	○ ● ● ● ● ○ ○ 3	3
No 4	○ ● ● ● ○ ● ● 4	4
≀	≀	≀
No 30	○ ● ○ ○ ○ ○ ● 30	30
No 31	○ ● ○ ○ ○ ○ ○ 31	31

○ ON ● OFF

Upper position (ON) Lower position (OFF)

(The shaded part shows knob)

(V2724)

3.2.4 Setting of Demand Operation

In order to save the power consumption, the capacity of outside unit is saved with control forcibly by using “Demand 1 Setting” or “Demand 2 Setting”.
To operate the unit with this mode, additional setting of “Normal Demand Setting” or external input by external control adapter is required.

[Demand 1 setting]

Setting	Standard for upper limit of power consumption
Demand 1 setting 1	Approx. 60%
Demand 1 setting 2 (factory setting)	Approx. 70%
Demand 1 setting 3	Approx. 80%

[Demand 2 setting]

Setting	Standard for upper limit of power consumption
Demand 2 setting 2 (factory setting)	Approx. 40%

★ Other protection control functions have precedence over the above operation.

Setting of Demand Operation

By connecting the external contact input to the demand input of the outside unit external control adapter (optional), the power consumption of unit operation can be saved suppressing the compressor operating condition.

A. When the demand operation is carried out by external instructions (with the use of the external control adapter for outside unit).

1. While in “Setting mode 2”, set the setting condition for set item No. 12 (Setting of external low noise/demand operation) to “YES”.
2. If necessary, while in “Setting mode 2”, select the set item No. 30 (Setting of Demand 1 level) and then set the setting condition to targeted mode.

B. When the normal demand operation is carried out. (Use of the external control adapter for outside unit is not required.)

1. While in “Setting mode 2”, make setting of the set item No. 32 (Setting of normal demand) to “ON”.
2. While in “Setting mode 2”, select the set item No. 30 (Setting of Demand 1 level) and then set the setting condition to targeted mode.

Image of operation in the case of A

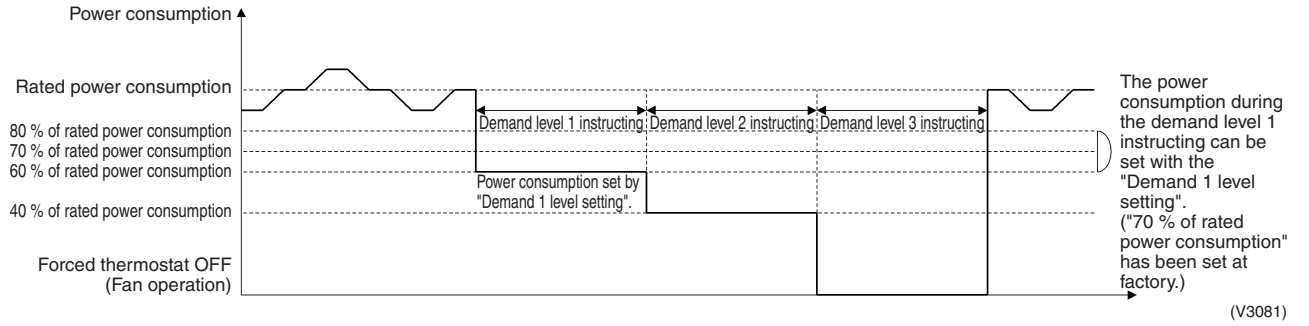


Image of operation in the case of B

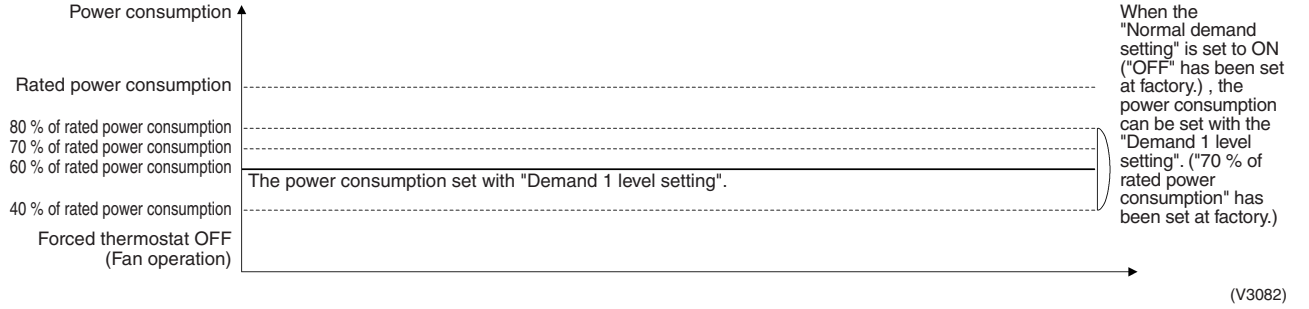
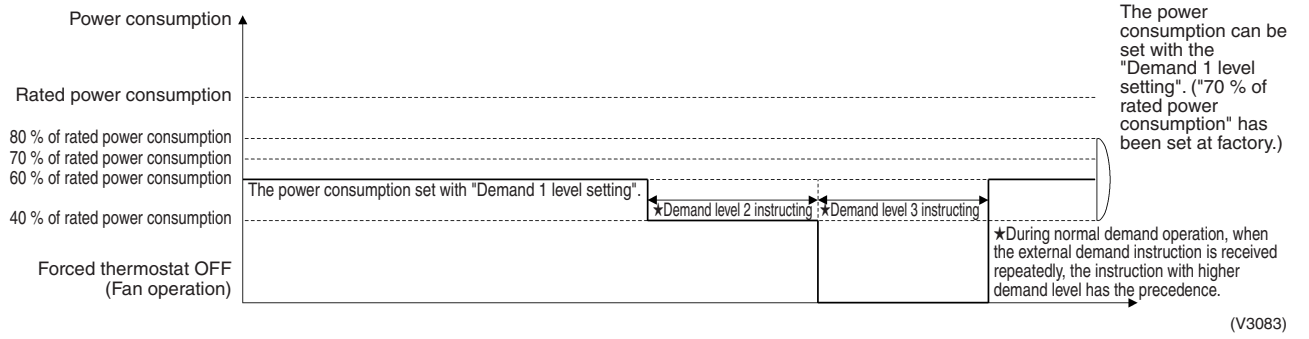


Image of operation in the case of A and B



Detailed Setting Procedure and Demand Control

1. Setting mode 1 (H1P off)

① In setting mode 2, push the BS1 (MODE button) one time. → Setting mode 2 is entered and H1P lights.
During the setting mode 1 is displayed, “In low noise operation” and “In demand control” are displayed.

2. Setting mode 2 (H1P on)

① In setting 1, push and hold the BS1 (MODE button) for more than 5 seconds. → Setting mode 2 is entered and H1P lights.
② Push the BS2 (SET button) several times and match the LED display with the Setting No. you want.
③ Push the BS3 (RETURN button) one time, and the present setting content is displayed.
→ Push the BS2 (SET button) several times and match the LED display with the setting content (as shown below) you want.
④ Push the BS3 (RETURN button) two times. → Returns to ①.
⑤ Push the BS1 (MODE button) one time. → Returns to the setting mode 1 and turns H1P off.

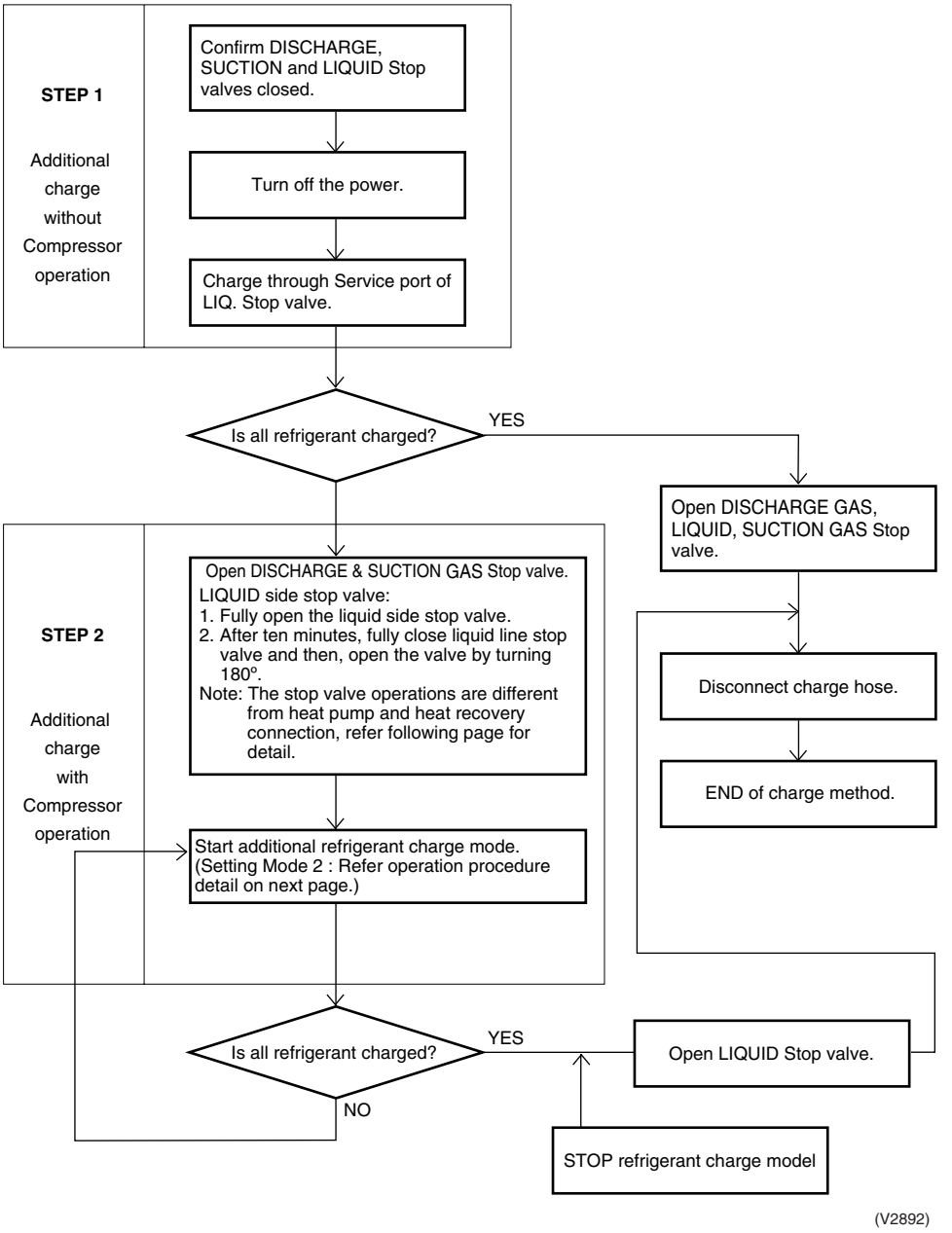
		①							②								③						
Setting No.	Setting contents	Setting No. indication							Setting No. indication							Setting contents	Setting contents indication (Initial setting)						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P	H1P	H2P	H3P	H4P	H5P	H6P	H7P		H1P	H2P	H3P	H4P	H5P	H6P	H7P
12	External low noise / Demand setting								○	●	●	○	○	●	●	NO (Factory setting)	○	●	●	●	●	●	◑
																YES	○	●	●	●	●	◑	●
30	Demand setting 1								○	●	○	○	○	○	●	60 % of rated power consumption	○	●	●	●	●	●	◑
																70 % of rated power consumption (Factory setting)	○	●	●	●	●	◑	●
																80 % of rated power consumption	○	●	●	●	◑	●	●
32	Normal demand setting								○	●	●	●	●	●	●	OFF (Factory setting)	○	●	●	●	●	●	◑
																ON	○	●	●	●	●	◑	●

Setting mode indication section Setting No. indication section Set contents indication section

3.2.5 Setting of Refrigerant Additional Charging Operation

When additional refrigerant is not charged all with outside unit in stop mode, operate the outside unit and charge the liquid refrigerant from the service port of liquid stop value. The additional charging operation is activated by pushbutton switch on the outside unit PC board.

[Additional refrigerant charge total flow]



Caution Refrigerant cannot be charged until field wiring has been completed.
Refrigerant may only be charged after performing the leak test and the vacuum drying.
When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of the danger of liquid hammer.
Charging with an unsuitable substance may cause explosions and accidents, so always ensure that the appropriate refrigerant (R-410A) is charged.
Refrigerant containers shall be opened slowly.
Always use protective gloves and protect your eyes when charging refrigerant.

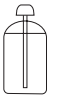
- This outside unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths some systems require additional charging of refrigerant.
- Determine the amount of refrigerant to be added by referring to the table, write it down on the included “Added Refrigerant” plate and attach it to the rear side of the front cover.
  Note: refer to the example of connection for the amount to be added.

Additional refrigerant charge procedure (1)-normally

- Charge the refrigerant to the liquid pipe in its liquid state. Since R-410A is a mixed refrigerant, its composition changes if charged in a state of gas and normal system operation would no longer be assured.
- Make sure to use installation tools you exclusively use on R-410A installations to withstand the pressure and to prevent foreign materials from mixing into the system.

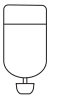
1. Before charging, check whether the tank has a siphon attached or not.
   How to charge with a siphon attached tank.

Charge with the tank upright.
(There is a siphon tube inside, so there is no need to turn the tank upside-down.)



How to charge with other tank.

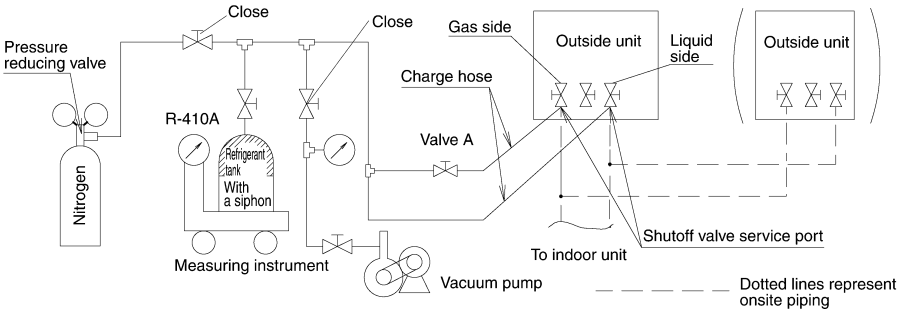
Charge with the tank upside-down.



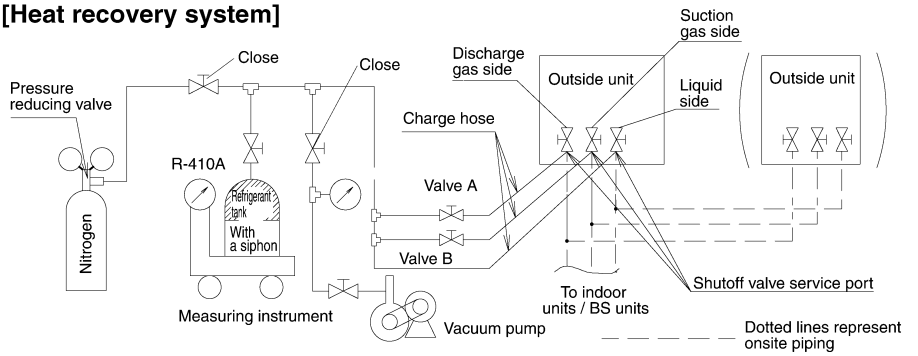
2. After the vacuum drying is finished, charge the additional refrigerant in its liquid state through the liquid shutoff valve service port.
   Taking into account following instructions:
   - Check that gas and liquid shutoff valves are closed.
   - Stop the compressor and charge the specified weight of refrigerant.
     (If the outside unit is not in operation and the total amount cannot be charged, follow the Additional refrigerant charge procedure (2) shown next page.)

■ Procedures for charging additional refrigerant.

[Heat pump system]



[Heat recovery system]



Additional refrigerant charge procedure (2)-by Additional refrigerant charge operation

To learn the system settings for additional refrigerant charging, refer to the [Service Precaution] label attached on the back of the electric box lid in the outside unit.

1. Fully open all stop valves (valve A and valve B must be left fully closed).
2. After ten minutes, fully close liquid line stop valve and then, open the valve by turning 180°.
   Start the additional refrigerant charge operation.
   See [Service precautions] Label for detail.
   If it is difficult to charge the refrigerant additionally, decrease the water temperature or warm the refrigerant tank.
   (Warm the refrigerant tank with a stupe or a warm hot water of 104 °F or less.)
3. After the system is charged with a specified amount of refrigerant, press the RETURN button (BS3) on the PC board (A1P) in the outside unit to stop the additional refrigerant charge operation.
4. Immediately open both liquid-side and gas-side stop valve.
   (If do not open the stop valve immediately, liquid seal may cause the pipe to burst.)

Note If the refrigerant cylinder is siphonal, set it upright while charging additional refrigerant.

Stop valve operation procedure

Caution Do not open the shutoff valve until “Checking of device and installation conditions” are completed. If the stop valve is left open without turning on power, it may cause refrigerant to buildup in the compressor, leading to insulation degradation.

Opening stop valve

1. Remove the cap and turn the valve counterclockwise with the hexagon wrench (JISB4648).
2. Turn it until the shaft stops.
   Do not apply excessive force to the stop valve. Doing so may break the valve body, as the valve is not a backseat type. Always use the special tool.
3. Make sure to tighten the cap securely.

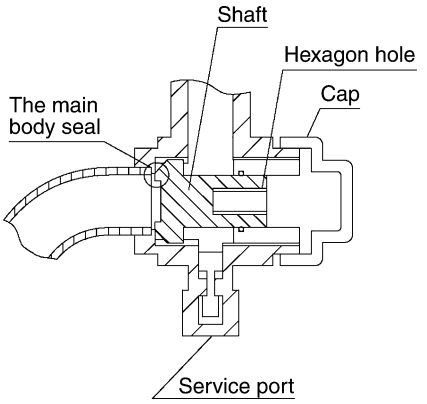
Closing stop valve

1. Remove the cap and turn the valve clockwise with the hexagon wrench.
2. Securely tighten the valve until the shaft contacts the main body seal.
3. Make sure to tighten the cap securely.
   * For the tightening torque, refer to the table on the below.

Tightening torque

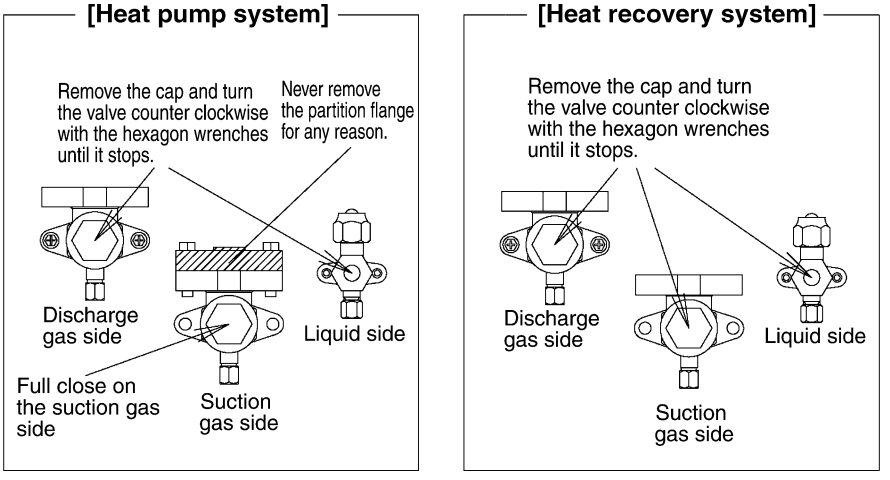
Stop valve size	Tightening torque ft.-lbf. (Turn clockwise to close)					
	Shaft (valve body)		Cap (valve lid)	Service port	Flare nut	Gas side accessory pipe (1)
Liquid side	3.98-4.87	Hexagonal wrench 4 mm	9.95-12.17	8.48-10.25	24.1-29.4	—
Gas side	19.91-24.33	Hexagonal wrench 10 mm	26.54-32.44	8.48-10.25	—	16.22-20.65

(Refer to figure below)



<Caution>

- Do not damage the cap sealing.
- Always use a charge hose for service port connection.
- After tightening the cap, check that no refrigerant leaks are present.
- After working, securely tighten the cover of service port without fail by specified torque.
- When loosening a flare nut, always use two wrenches in combination. When connecting the piping, always use a spanner and torque wrench in combination to tighten the flare nut.
- When connecting a flare nut, coat the flare (inner and outer faces) with ether oil or ester oil and hand-tighten the nut 3 to 4 turns as the initial tightening.
- Do not forget to open the stop valve before starting operation.



3.2.6 Setting of Refrigerant Recovery Mode

When carrying out the refrigerant collection on site, fully open the respective expansion valve of indoor and outside units

[Operation procedure]

① In **setting mode 2** with units in stop mode, set “B Refrigerant Recovery / Vacuuming mode” to ON. The respective expansion valve of indoor and outside units are fully opened. (H2P turns to display “TEST OPERATION” (blinks), “TEST OPERATION” and “IN CENTRALIZED CONTROL” are displayed on the remote controller, and the operation is prohibited.

② Collect the refrigerant using a refrigerant recovery unit. (See the instruction attached to the refrigerant recovery unit for more detal.)

③ Press Mode button “BS1” once and reset “Setting Mode 2”.

3.2.7 Setting of Vacuuming Mode

In order to perform vacuuming operation at site, fully open the expansion valves of indoor and outside units to turn on some solenoid valves.

[Operating procedure]

① With **Setting Mode 2** while the unit stops, set (B) Refrigerant recovery / Vacuuming mode to ON. The expansion valves of indoor and outside units fully open and some of solenoid valves open.
(H2P blinks to indicate the test operation, and the remote controller displays “Test Operation” and “In Centralized control”, thus prohibiting operation.)
After setting, do not cancel “Setting Mode 2” until completion of Vacuuming operation.

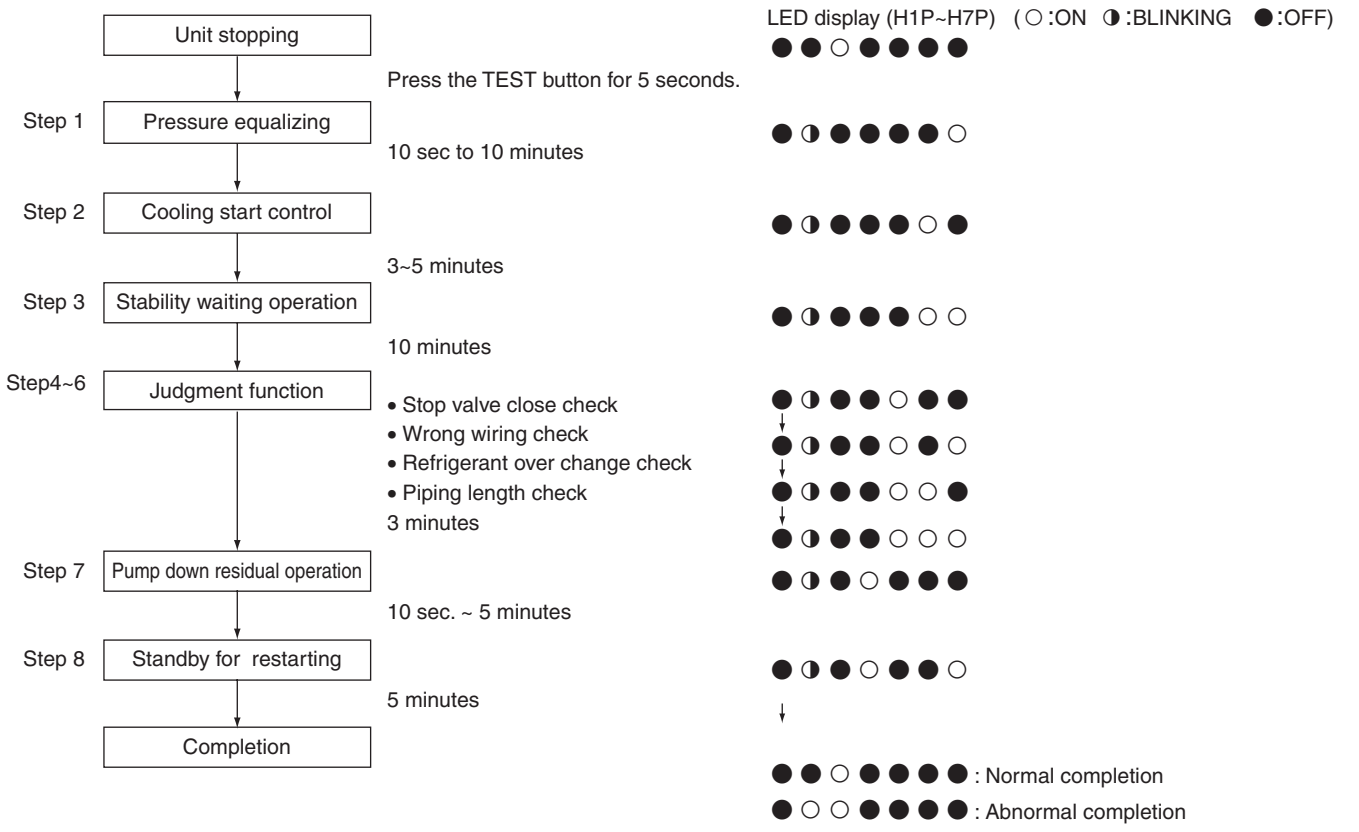
② Use the vacuum pump to perform vacuuming operation.

③ Press Mode button “BS1” once and reset “Setting Mode 2”.

3.2.8 Check Operation

To prevent any trouble in the period of installation at site, the system is provided with a test operation mode enabling check for incorrect wiring, stop valve left in closed, coming out (or misplacing with suction pipe thermistor) of discharge pipe thermistor and judgment of piping length, refrigerant overcharging, and learning for the minimum opening degree of motorized valve.

CHECK OPERATION FUNCTION



3.2.9 Power Transistor Check Operation

When the inverter system malfunctions (malfunction of inverter, INV compressor), to locate where the malfunction occurs, switching to the power transistor check mode of inverter in the service mode setting enables not to judge the position detection signal malfunction but to output waveform only during inverter operation. (The waveform can be checked by disconnecting the wiring of compressor.)
After the completion of checks, return the system to the previous mode and wait for 30 seconds or more until the discharge of capacitor is completed. Then, conduct a subsequent work.

Notes: Be sure to disconnect the compressor wiring when conducting the check operation mentioned above.
When the output voltage is approx. 100~200 V (10 Hz) and the voltage balance between phases U-V, V-W, W-U is within ±5%, the inverter PCB is normal.

Refer the detail power transistor check to page 281.

3.2.10 Emergency Operation

If the compressor cannot operate, this control inhibits any applicable compressor or outside unit from operating to perform emergency operation only with the operative compressor or outside unit.

Caution
For making a compressor unable to operate due to malfunction, etc., be sure to conduct the work with emergency operation setting.
Never execute work such as disconnection of the power cable from magnet contactor. (Otherwise, other normal compressors may malfunction.)
*** Because the units will be operated in the combination with which oil pressure equalization between compressors cannot be performed.**

3.2.11 Restrictions for Emergency Operation

- If the emergency operation is set while the outside unit is in operation, the outside unit stops once after pump-down residual operation (a maximum of 5 minutes elapsed).

3.2.12 In the Case of Multi-Outside-Unit System

Automatic backup operation
With multi-outside-unit system, if a certain outside unit system malfunctions (i.e., the system stops and indoor unit remote controller displays the malfunction), by resetting the system with the indoor unit remote controller, the applicable outdoor unit is inhibited from operating for 8 hours, thus making it possible to perform emergency operation automatically.
However, in the event any of the following malfunctions occurs, automatic backup operation can be performed.

Malfunctions under which automatic backup operation can be performed:
- E3, E4, E5, E7
- F3
- H7, H9
- J2, J3, J5, J6, J7, J9, JA, JC
- L3, L4, L5, L8, L9, LC
- U2, UJ

Emergency operation with settings in service mode

* "Inhibition of operation" is set with each outside unit.

Make the following settings with the master unit. (Setting with the slave unit becomes disabled.)

* Discriminate the operating status of the master unit/slave units through the following LED display.

LED display (○:ON ●:OFF ◑:Blink)
H1P — — — H7P H8P

Master:	●●○●●●●	○
Slave 1:	●●●●●●●	◑
Slave 2:	●●●●●●●	●
	(Factory set)	

- To inhibit the master unit from operating → Set setting mode 2 from No. 38 to No. 2.

LED display (○:ON ●:OFF ◑:Blink)
H1P — — — H7P

(Procedure)		
(1) Press and hold the MODE button (BS1) for 5 sec. or more.	○●●●●●●	
(2) Press the SET button (BS2) 38 times.	○○●●○○●	
(3) Press the RETURN button (BS3) once.	○●●●●●◑	(Factory set)
(4) Press the SET button (BS2) once.	○●●●●◑●	
(5) Press the RETURN button (BS3) twice.	○●●●●●●	
(6) Press the MODE button (BS1) once.	●●○●●●●	

- To inhibit the slave unit 1 from operating → Set setting mode 2 from No. 39 to No. 2.

LED display (○:ON ●:OFF ◑:Blink)
H1P — — — H7P

(Procedure)		
(1) Press and hold the MODE button (BS1) for 5 sec. or more.	○●●●●●●	
(2) Press the SET button (BS2) 39 times.	○○●●○○○	
(3) Press the RETURN button (BS3) once.	○●●●●●◑	(Factory set)
(4) Press the SET button (BS2) once.	○●●●●◑●	
(5) Press the RETURN button (BS3) twice.	○●●●●●●	
(6) Press the MODE button (BS1) once.	●●○●●●●	

- To inhibit the slave unit 2 from operating → Set setting mode 2 from No. 40 to No. 2.

LED display (○:ON ●:OFF ◑:Blink)
H1P — — — H7P

(Procedure)		
(1) Press and hold the MODE button (BS1) for 5 sec. or more.	○●●●●●●	
(2) Press the SET button (BS2) 40 times.	○○●○●●●	
(3) Press the RETURN button (BS3) once.	○●●●●●◑	(Factory set)
(4) Press the SET button (BS2) once.	○●●●●◑●	
(5) Press the RETURN button (BS3) twice.	○●●●●●●	
(6) Press the MODE button (BS1) once.	●●○●●●●	

- In the case of multi-outside-unit system, when the above "Inhibition of operation" is set, outside unit rotation is not functional.

Notes : Reset the power supply during the outside unit is stopping to cancel the automatic backup operation forcibly.

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Troubleshooting

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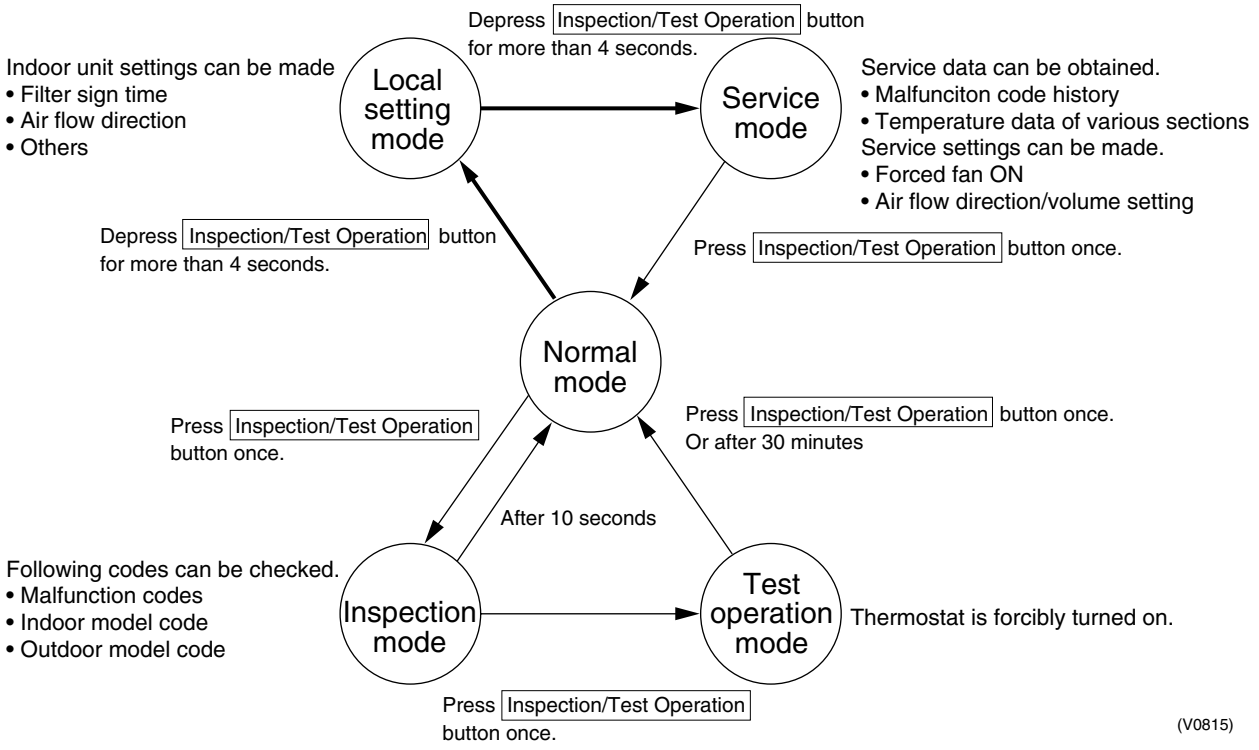
1. Troubleshooting by Remote Controller

1.1 The INSPECTION / TEST Button

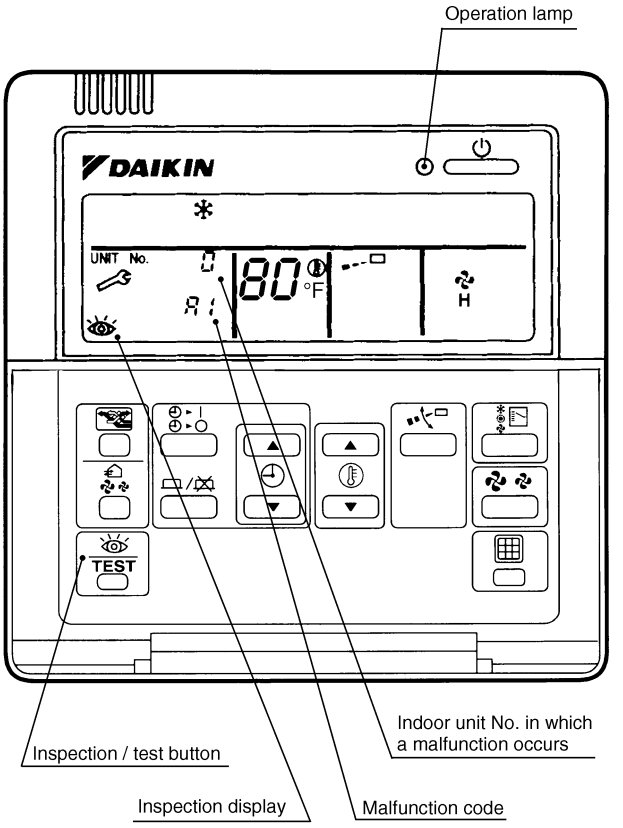
The following modes can be selected by using the [Inspection/Test Operation] button on the remote control.



1.2 Self-diagnosis by Wired Remote Controller

Explanation

If operation stops due to malfunction, the remote controller's operation LED blinks, and malfunction code is displayed. (Even if stop operation is carried out, malfunction contents are displayed when the inspection mode is entered.) The malfunction code enables you to tell what kind of malfunction caused operation to stop. See page 148 for malfunction code and malfunction contents.



(S1155)

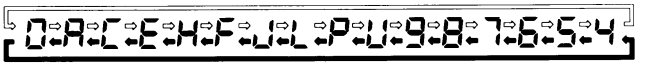
1.3 Self-diagnosis by Wireless Remote Controller

In the Case of BRC7C Type BRC7E Type BRC4C Type

If equipment stops due to a malfunction, the operation indicating LED on the light reception section flashes.
The malfunction code can be determined by following the procedure described below. (The malfunction code is displayed when an operation error has occurred. In normal condition, the malfunction code of the last problem is displayed.)

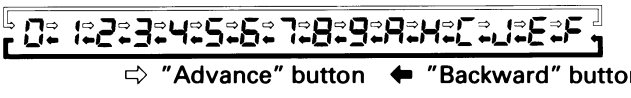
1. Press the INSPECTION/TEST button to select “Inspection”.
   The equipment enters the inspection mode. The “Unit” indication lights and the Unit No. display shows flashing “0” indication.
2. Set the Unit No.
   Press the UP or DOWN button and change the Unit No. display until the buzzer (*1) is generated from the indoor unit.
   *1 Number of beeps
   3 short beeps : Conduct all of the following operations.
   1 short beep : Conduct steps 3 and 4.
   Continue the operation in step 4 until a buzzer remains ON. The continuous buzzer indicates that the malfunction code is confirmed.
   Continuous beep : No abnormality.
3. Press the MODE selector button.
   The left “0” (upper digit) indication of the malfunction code flashes.
4. Malfunction code upper digit diagnosis
   Press the UP or DOWN button and change the malfunction code upper digit until the malfunction code matching buzzer (*2) is generated.

■ The upper digit of the code changes as shown below when the UP and DOWN buttons are pressed.

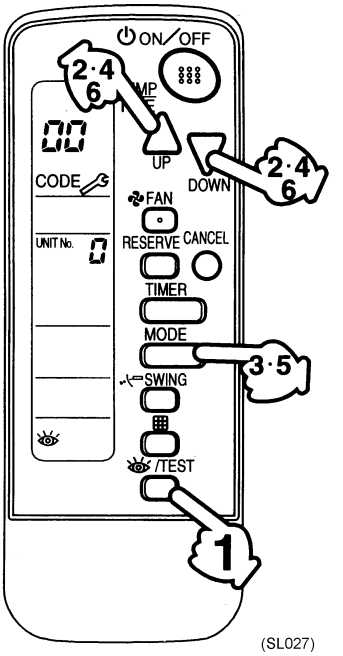


   *2 Number of beeps
   Continuous beep : Both upper and lower digits matched. (Malfunction code confirmed)
   2 short beeps : Upper digit matched.
   1 short beep : Lower digit matched.
5. Press the MODE selector button.
   The right “0” (lower digit) indication of the malfunction code flashes.
6. Malfunction code lower digit diagnosis
   Press the UP or DOWN button and change the malfunction code lower digit until the continuous malfunction code matching buzzer (*2) is generated.

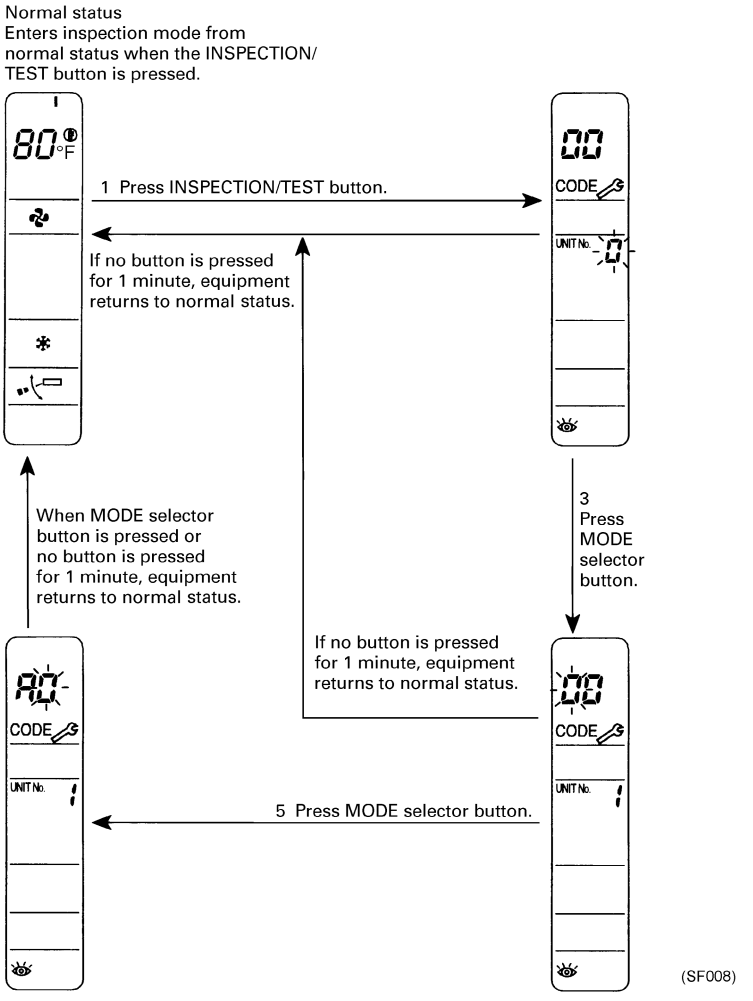
■ The lower digit of the code changes as shown below when the UP and DOWN buttons are pressed.



(SE007)

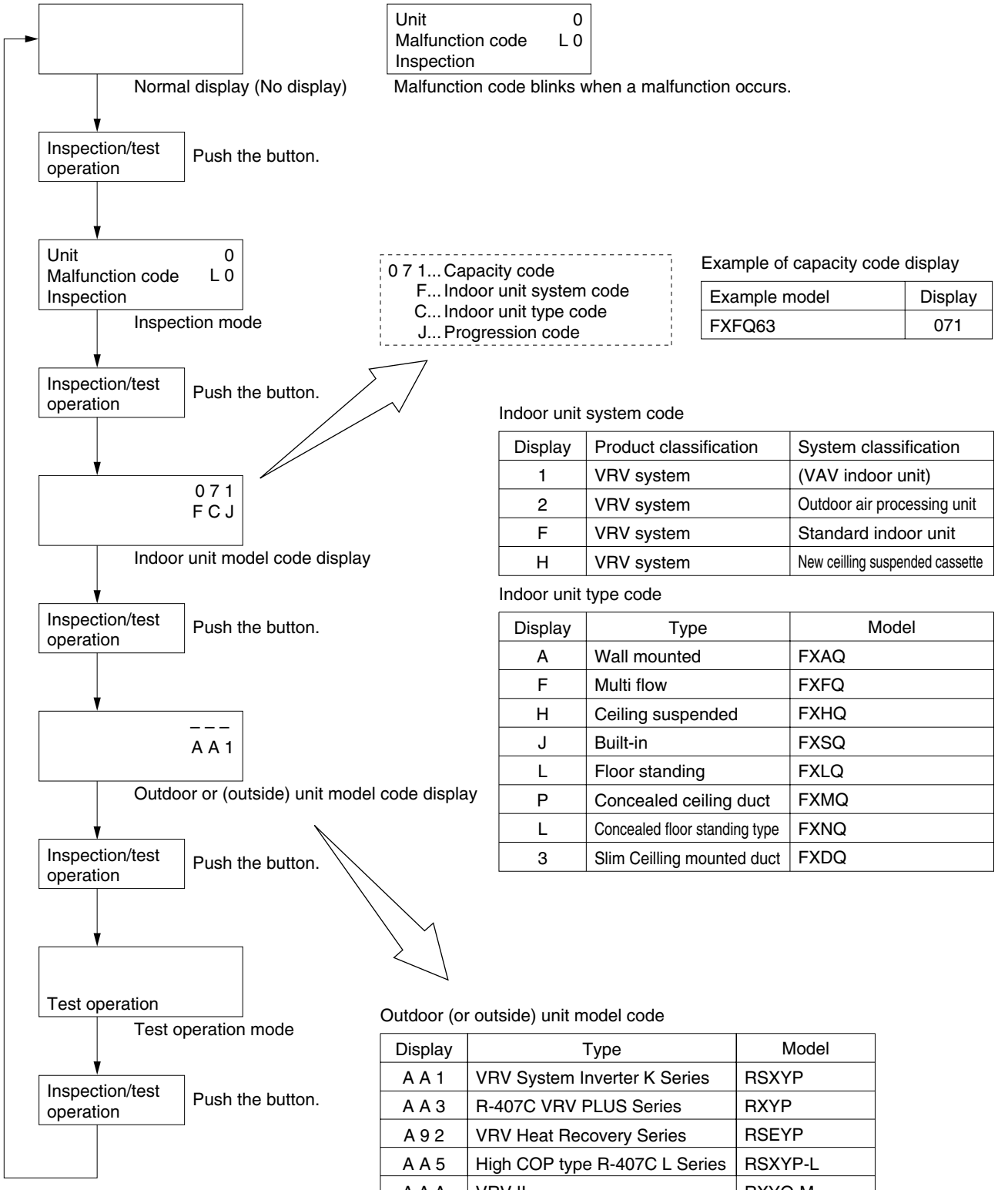


(SL027)



(SF008)

1.4 Operation of the Remote Controller's Inspection / Test Operation Button



Example of capacity code display

Example model	Display
FXFQ63	071

Indoor unit system code

Display	Product classification	System classification
1	VRV system	(VAV indoor unit)
2	VRV system	Outdoor air processing unit
F	VRV system	Standard indoor unit
H	VRV system	New ceilling suspended cassette

Indoor unit type code

Display	Type	Model
A	Wall mounted	FXAQ
F	Multi flow	FXFQ
H	Ceiling suspended	FXHQ
J	Built-in	FXSQ
L	Floor standing	FXLQ
P	Concealed ceiling duct	FXMQ
L	Concealed floor standing type	FXNQ
3	Slim Ceilling mounted duct	FXDQ

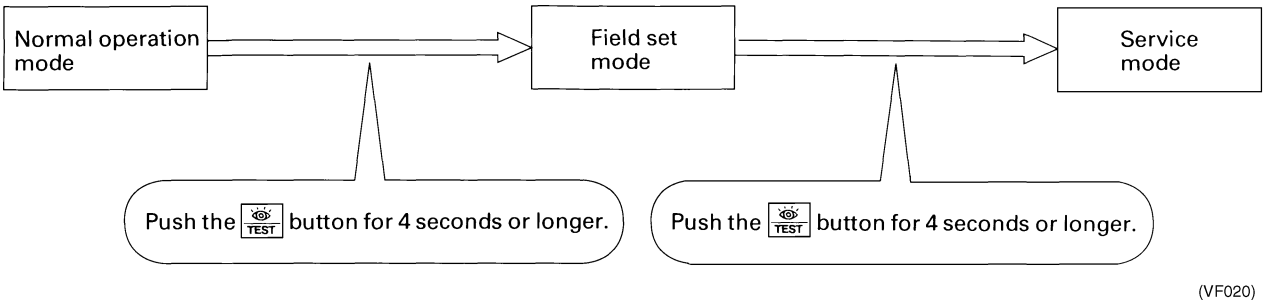
Outdoor (or outside) unit model code

Display	Type	Model
A A 1	VRV System Inverter K Series	RSXYP
A A 3	R-407C VRV PLUS Series	RXYP
A 9 2	VRV Heat Recovery Series	RSEYP
A A 5	High COP type R-407C L Series	RSXYP-L
A A A	VRV II	RXYQ-M
A 9 6	VRV II Heat Recovery	REYQ-M
A F C	VRV II Water cooled inverter series	RWEYQ-M

(V2775)

1.5 Remote Controller Service Mode

How to Enter the Service Mode



(VF020)

Service Mode Operation Method

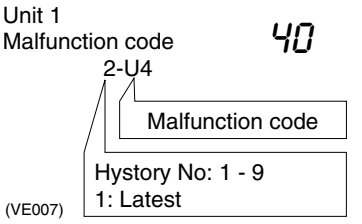
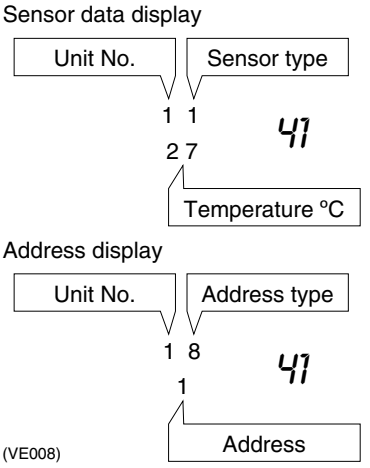
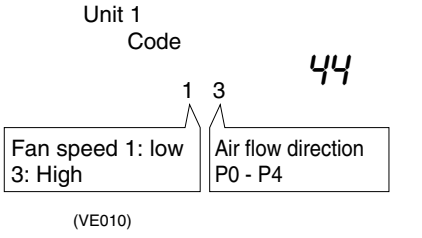
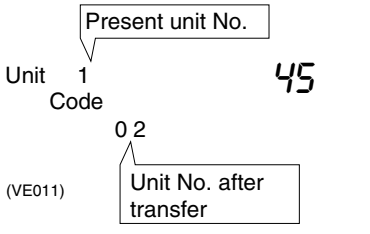
1. Select the mode No.
Set the desired mode No. with the button.
(For wireless remote controller, Mode 43 only can be set.)

2. Select the unit No. (For group control only)
Select the indoor unit No. to be set with the time mode . (For wireless remote controller, button.)

3. Make the settings required for each mode. (Modes 41, 44, 45)
In case of Mode 44, 45, push button to be able to change setting before setting work. (LCD "code" blinks.)
For details, refer to the table in next page.

4. Define the setting contents. (Modes 44, 45)
Define by pushing the timer button.
After defining, LCD "code" changes blinking to ON.

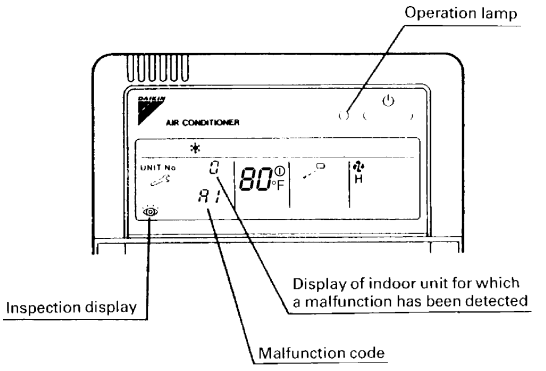
5. Return to the normal operation mode.
Push the button one time.

Mode No	Function	Contents and operation method	Remote controller display example
40	Malfunction hysteresis display	Display malfunction hysteresis. The history No. can be changed with the button.	
41	Display of sensor and address data	Display various types of data. Select the data to be displayed with the button. Sensor data 0: Thermostat sensor in remote controller. 1: Suction 2: Liquid pipe 3: Gas pipe Address data 4: Indoor unit address 5: Outside unit address 6: BS unit address 7: Zone control address 8: Cool/heat group address 9: Demand / low noise address	
43	Forced fan ON	Manually turn the fan ON by each unit. (When you want to search for the unit No.) By selecting the unit No. with the button, you can turn the fan of each indoor unit on (forced ON) individually.	
44	Individual setting	Set the fan speed and air flow direction by each unit Select the unit No. with the time mode button. Set the fan speed with the button. Set the air flow direction with the button.	
45	Unit No. transfer	Transfer unit No. Select the unit No. with the button. Set the unit No. after transfer with the button.	
46 47	This function is not used by VRV R-410A Heat Pump 50Hz.		

1.6 Remote Controller Self-Diagnosis Function

The remote controller switches are equipped with a self diagnosis function so that more appropriate maintenance can be carried out. If a malfunction occurs during operation, the operation lamp, malfunction code and display of malfunctioning unit No. let you know the contents and location of the malfunction.

When there is a stop due to malfunction, the contents of the malfunction given below can be diagnosed by a combination of operation lamp, INSPECTION display of the liquid crystal display and display of malfunction code. It also lets you know the unit No. during group control.



(VL050)

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page Referred
Indoor Unit	A0	◑	◑	◑	Error of external protection device	154
	A1	◑	◑	◑	PC board defect, E^2 PROM defect	155
	A3	◑	◑	◑	Malfunction of drain level control system (33H)	156
	A6	◑	◑	◑	Fan motor (MF) lock, overload	158,159
	A7	○	●	◑	Malfunction of swing flap motor (MA)	162
	A9	◑	◑	◑	Malfunction of moving part of electronic expansion valve (Y1E)	164
	AF	○	●	◑	Drain level above limit	166
	AH	○	●	◑	Malfunction of air filter maintenance	—
	AJ	◑	◑	◑	Malfunction of capacity setting	167
	C4	◑	◑	◑	Malfunction of thermistor (R2T) for heat exchange (loose connection, disconnection, short circuit, failure)	168
	C5	◑	◑	◑	Malfunction of thermistor (R3T) for gas pipes (loose connection, disconnection, short circuit, failure)	169
	C9	◑	◑	◑	Malfunction of thermistor (R1T) for air inlet (loose connection, disconnection, short circuit, failure)	170
	CJ	○	○	○	Malfunction of thermostat sensor in remote controller	171
Outside Unit	E1	◑	◑	◑	PC board defect	172
	E3	◑	◑	◑	Actuation of high pressure switch	173
	E4	◑	◑	◑	Actuation of low pressure sensor	175
	E5	◑	◑	◑	Compressor motor lock	177
	E9	◑	◑	◑	Malfunction of moving part of electronic expansion valve (Y1E~3E)	179
	F3	◑	◑	◑	Abnormal discharge pipe temperature	181
	F6	◑	◑	◑	Refrigerant overcharged	182
	HJ	◑	◑	◑	Water system defect	184
	J3	◑	◑	◑	Malfunction of discharge pipe thermistor (R3T) (loose connection, disconnection, short circuit, failure)	186
	J4	◑	◑	◑	Malfunction of heat exchanger gas pipe thermistor (R4T)	187
	J5	◑	◑	◑	Malfunction of thermistor (R2T) for suction pipe (loose connection, disconnection, short circuit, failure)	188
	J7	◑	◑	◑	Malfunction of liquid pipe thermistor (R6T)	189
	J9	◑	◑	◑	Malfunction of the evaporating side gas pipe temperature thermistor on subcooling heat exchanger (R5T)	190
	JA	◑	◑	◑	Malfunction of discharge pipe pressure sensor	191
	JC	◑	◑	◑	Malfunction of suction pipe pressure sensor	193
	L0	◑	◑	◑	Inverter system error	—
	L1	◑	◑	◑	Malfunction of PC board	195
	L4	◑	◑	◑	Malfunction of inverter radiating fin temperature rise	196
	L5	◑	◑	◑	Inverter compressor motor grounding, short circuit	197
	L6	◑	◑	◑	Compressor motor coil grounding or short circuit	—
	L8	◑	◑	◑	Inverter current abnormal	198
	L9	◑	◑	◑	Inverter start up error	200
	LA	◑	◑	◑	Malfunction of power unit	—
	LC	◑	◑	◑	Malfunction of transmission between inverter and control PC board	201
	P1	◑	◑	◑	Inverter over-ripple protection	203
	P4	◑	◑	◑	Malfunction of inverter radiating fin temperature rise sensor	205
	PJ	◑	◑	◑	Faulty field setting after replacing main PC board or faulty combination of PC board	206

	Malfunction code	Operation lamp	Inspection display	Unit No.	Malfunction contents	Page Referred
System	U0	○	●	◑	Low pressure drop due to refrigerant shortage or electronic expansion valve failure	207
	U1	◑	◑	◑	Reverse phase / open phase	209
	U2	◑	◑	◑	Power supply insufficient or instantaneous failure	210
	U3	◑	◑	◑	Check operation is not conducted.	212
	U4	◑	◑	◑	Malfunction of transmission between indoor and outside units	213
	U5	◑	◑	◑	Malfunction of transmission between remote controller and indoor unit	215
	U5	●	○	●	Failure of remote controller PC board or setting during control by remote controller	215
	U7	◑	◑	◑	Malfunction of transmission between outside units	216
	U8	◑	◑	●	Malfunction of transmission between master and slave remote controllers (malfunction of slave remote controller)	218
	U9	◑	◑	◑	Malfunction of transmission between indoor unit and outside unit in the same system	219
	UA	◑	◑	◑	Excessive number of indoor units etc.	221
	UC	○	○	○	Address duplication of central remote controller	223
	UE	◑	◑	◑	Malfunction of transmission between central remote controller and indoor unit	224 235
	UF	◑	◑	◑	Refrigerant system not set, incompatible wiring / piping	226
	UH	◑	◑	◑	Malfunction of system, refrigerant system address undefined	227
Centralized Control and Schedule Timer	M1	○ or ●	◑	◑	PC board defect	229 237
	M8	○ or ●	◑	◑	Malfunction of transmission between optional controllers for centralized control	230 238
	MA	○ or ●	◑	◑	Improper combination of optional controllers for centralized control	232 240
	MC	○ or ●	◑	◑	Address duplication, improper setting	234 242
Heat Reclaim Ventilation	64	○	●	◑	Indoor unit's air thermistor error	—
	65	○	●	◑	Outside air thermistor error	—
	6A	○	●	◑	Damper system alarm	—
	6A	◑	◑	◑	Damper system + thermistor error	—
	6F	○	●	◑	Malfunction of simple remote controller	—
	6H	○	●	◑	Malfunction of door switch or connector	—
	94	◑	◑	◑	Internal transmission error	—

The system operates for malfunction codes indicated in black squares, however, be sure to check and repair.

Malfunction code indication by outdoor unit PCB

To enter the monitor mode, push the MODE button (BS1) when in "Setting mode 1".

* Refer P.122 for Monitor mode.

<Selection of setting item>

Push the SET button (BS2) and set the LED display to a setting item.

* Refer P.122 for Monitor mode.

<Confirmation of malfunction 1>

Push the RETURN button (BS3) once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the SET button (BS2) once to display "Second digit" of malfunction code.

Detail description on next page.

<Confirmation of malfunction 3>

Push the SET button (BS2) once to display "master or slave1 or slave2" and "malfunction location".

Push the RETURN button (BS3) and switches to the initial status of "Monitor mode".

* Push the MODE button (BS1) and returns to "Setting mode 1".

Contents of malfunction		Malfunction code
Abnormal discharge pressure	HPS activated	E3
Abnormal suction pressure	Abnormal Pe	E4
Compressor lock	Detection of INV compressor lock	E5
Over load, over current, abnormal lock of outdoor unit fan motor	Instantaneous over current of DC fan motor Detection of DC fan motor lock	E7
Malfunction of electronic expansion valve	EV1	E9
	EV3	
Abnormal position signal of outside unit fan motor	Abnormal position signal of DC fan motor	H7
Faulty sensor of outside air temperature	Faulty Ta sensor	H9
Abnormality in water system		HJ
Abnormal discharge pipe temperature	Abnormal Td	F3
Abnormal heat exchanger temperature	Refrigerant over charge	F6
Faulty sensor of discharge pipe temperature	Faulty Tdi sensor	J3
Faulty sensor of heat exchanger gas pipe thermistor	Faulty Tg sensor	J4
Faulty sensor of suction pipe temperature	Faulty Ts sensor	J5
Faulty sensor of receiver temperature	Faulty Tl sensor	J7
Faulty sensor of subcool heat exchanger temperature	Faulty Tsh sensor	J9
Faulty sensor of discharge pressure	Faulty Pc sensor	JA
Faulty sensor of suction pressure	Faulty Pe sensor	JC
Faulty Inverter PC board	Faulty IPM	L1
	Faulty Current sensor 1	
	Faulty Current sensor 2	
	Abnormal DIPSW setting	
Inverter radiation fin temperature rising	Over heating of inverter radiation fin temperature	L4
DC output over current	Inverter instantaneous over current	L5
Electronic thermal switch	Electronic thermal switch 1	L8
	Electronic thermal switch 2	
	Out-of-step	
	Speed down after startup	
	Lightening detection	
Stall prevention (Limit time)	Stall prevention (Current increasing)	L9
	Stall prevention (Faulty startup)	
	Abnormal wave form in startup	
	Out-of-step	
Transmission error between inverter and outdoor unit	Inverter transmission error	LC
Open phase/Power supply imbalance	Imbalance of inverter power supply voltage	P1
Faulty temperature sensor inside switch box	Faulty thermistor of inverter box	P3
Faulty temperature sensor of inverter radiation fin	Faulty thermistor of inverter fin	P4
Incorrect combination of inverter and fan driver	Incorrect combination of inverter and fan driver	PJ

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3						
	LED1	LED2	LED3	LED4	LED5	LED6	LED7	LED1	LED2	LED3	LED4	LED5	LED6	LED7	LED1	LED2	LED3	LED4	LED5	LED6	LED7
E3	◑	●	○	●	●	◑	◑	◑	○	●	●	●	◑	◑	◑	○	○			●	●
E4								◑	○	●	●	◑	●	●	◑	○	○			●	●
E5								◑	○	●	●	◑	●	◑	◑	○	○			●	●
E7								◑	○	●	●	◑	◑	◑	◑	○	○			●	◑
E9								◑	○	●	◑	●	●	◑	◑	○	○			●	◑
															◑	○	○			◑	◑
H7	◑	●	○	●	◑	●	●	◑	○	●	●	◑	◑	◑	◑	○	○			●	◑
H9								◑	○	●	◑	●	●	◑	◑	○	○			●	●
HJ								◑	○	●	◑	◑	●	◑	◑	○	○			●	●
F3	◑	●	○	●	◑	●	◑	◑	○	●	●	●	◑	◑	◑	○	○			●	●
F6								◑	○	●	●	◑	◑	●	◑	○	○			●	●
J3	◑	●	○	●	◑	◑	●	◑	○	●	●	●	◑	◑	◑	○	○			●	◑
J4								◑	○	●	●	○	●	●	◑	○	○			●	◑
J5								◑	○	●	●	◑	●	◑	◑	○	○			●	●
J7								◑	○	●	●	◑	◑	◑	◑	○	○			●	●
J9								◑	○	●	◑	●	●	◑	◑	○	○			●	●
JA								◑	○	●	◑	●	◑	●	◑	○	○			●	●
JC								◑	○	●	◑	◑	●	●	◑	○	○			●	●
L1	◑	●	○	●	◑	◑	◑	◑	○	●	●	●	●	◑	◑	○	○			●	●
								◑	○	●	●	●	●	◑	◑	○	○			●	◑
								◑	○	●	●	●	●	◑	◑	○	○			◑	●
								◑	○	●	●	●	●	◑	◑	○	○			◑	◑
L4	◑	●	○	●	◑	◑	●	◑	○	●	●	◑	●	●	◑	○	○			●	●
L5								◑	○	●	●	◑	●	◑	◑	○	○			●	●
L8								◑	○	●	◑	●	●	●	◑	○	○			●	●
L9								◑	○	●	◑	●	●	◑	◑	○	○			●	●
LC								◑	○	●	◑	◑	●	●	◑	○	○			●	●
P1	◑	●	○	◑	●	●	●	◑	○	●	●	●	●	◑	◑	○	○			●	●
P3								◑	○	●	●	●	◑	◑	◑	○	○			●	●
P4								◑	○	●	●	◑	●	●	◑	○	○			●	●
PJ								◑	○	●	◑	◑	●	◑	◑	○	○			●	●

○ : ON
◑ : Blink
● : OFF

Malfunction code 1st digit display section

○ : ON
◑ : Blink
● : OFF

Malfunction code 2nd digit display section

Master	●	●
Slave 1	●	◑
Slave 2	◑	●

Malfunction location

To enter the monitor mode, push the MODE button (BS1) when in "Setting mode 1".

* Refer P.122 for Monitor mode.

<Selection of setting item>

Push the SET button (BS2) and set the LED display to a setting item.

* Refer P.122 for Monitor mode.

<Confirmation of malfunction 1>

Push the RETURN button (BS3) once to display "First digit" of malfunction code.

<Confirmation of malfunction 2>

Push the SET button (BS2) once to display "Second digit" of malfunction code.

Detail description on next page.

<Confirmation of malfunction 3>

Push the SET button (BS2) once to display "master or slave1 or slave2" and "malfunction location".

Push the RETURN button (BS3) and switches to the initial status of "Monitor mode".

* Push the MODE button (BS1) and returns to "Setting mode 1".

Contents of malfunction		Malfunction code
Gas shortage	Gas shortage alarm	U0
Reverse phase	Reverse phase error	U1
Abnormal power supply voltage	Insufficient inverter voltage	U2
	Inverter open phase (phase T)	
	Charging error of capacitor in inverter main circuit	
No implementation of test-run		U3
Transmission error between indoor and outdoor unit	I/O transmission error	U4
Transmission error between outdoor units, transmission error between thermal storage units, duplication of IC address	O/O transmission error	U7
Transmission error of other system	Indoor unit system malfunction in other system or other unit of own system	U9
Erroneous on-site setting	Abnormal connection with excessive number of indoor units	UA
	Conflict of refrigerant type in indoor units	
Faulty system function	Incorrect wiring (Auto address error)	UH
Transmission error in accessory devices, conflict in wiring and piping, no setting for system	Malfunction of multi level converter, abnormality in conflict check	UJ UF

Malfunction code	Confirmation of malfunction 1							Confirmation of malfunction 2							Confirmation of malfunction 3						
	LED1	LED2	LED3	LED4	LED5	LED6	LED7	LED1	LED2	LED3	LED4	LED5	LED6	LED7	LED1	LED2	LED3	LED4	LED5	LED6	LED7
U0	◑	●	○	◑	●	●	◑	◑	○	●	●	●	●	●	◑	○	○			●	●
U1								◑	○	●	●	●	●	◑	◑	○	○			●	●
U2								◑	○	●	●	●	◑	●	◑	○	○			●	◑
U3								◑	○	●	●	●	◑	◑	◑	○	○			●	●
U4								◑	○	●	●	◑	●	●	◑	○	○			●	●
U7								◑	○	●	●	◑	◑	◑	◑	○	○			●	●
U9								◑	○	●	◑	●	●	◑	◑	○	○			●	●
UA								◑	○	●	◑	●	◑	●	◑	○	○			●	●
UH								◑	○	●	◑	●	◑	◑	◑	○	○			●	●
UJ UF								◑ ◑	○ ○	● ●	◑ ◑	◑ ◑	● ◑	◑ ◑	◑ ◑	○ ○	○ ○			● ●	● ●

○ : ON
◑ : Blink
● : OFF

Malfunction code 1st digit display section

○ : ON
◑ : Blink
● : OFF

Malfunction code 2nd digit display section

Master	●	●
Slave 1	●	◑
Slave 2	◑	●

Malfunction location

2. Troubleshooting by Indication on the Remote Controller

2.1 "A0" Indoor Unit: Error of External Protection Device

Remote Controller Display

A0

Applicable Models

All indoor unit models

Method of Malfunction Detection

Detect open or short circuit between external input terminals in indoor unit.

Malfunction Decision Conditions

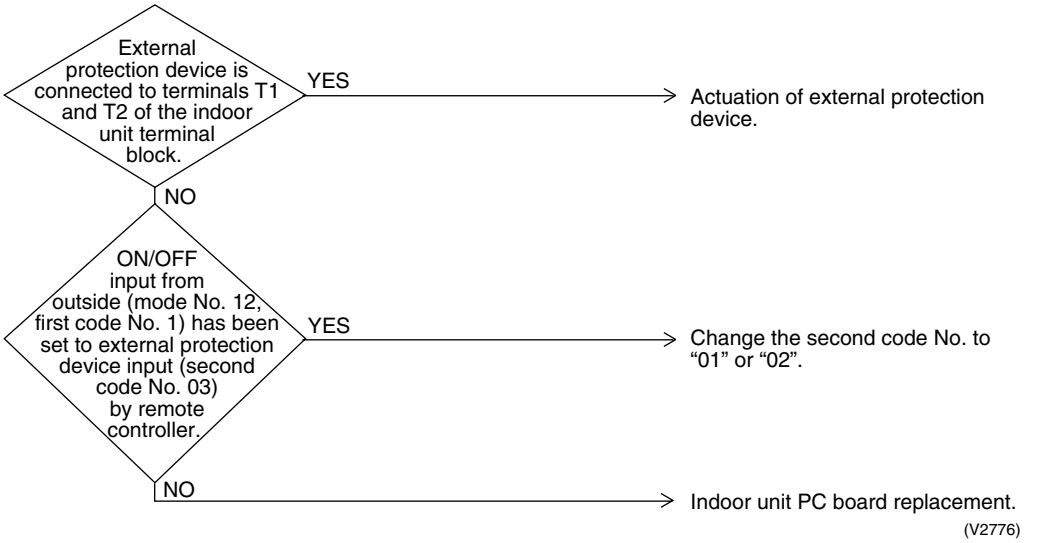
When an open circuit occurs between external input terminals with the remote controller set to "external ON/OFF terminal".

Supposed Causes

- Actuation of external protection device
- Improper field set
- Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.2 "A1" Indoor Unit: PC Board Defect

Remote Controller Display

A1

Applicable Models

All indoor unit models

Method of Malfunction Detection

Check data from E²PROM.

Malfunction Decision Conditions

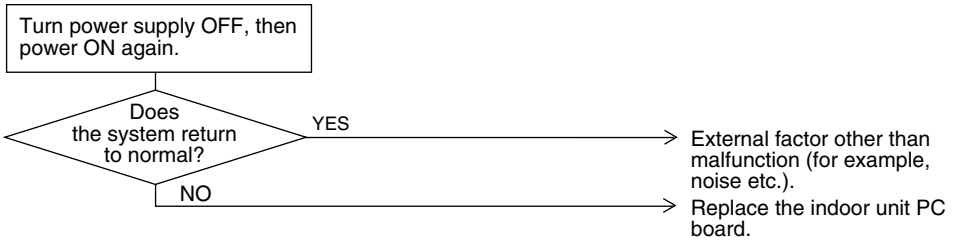
When data could not be correctly received from the E²PROM
E²PROM : Type of nonvolatile memory. Maintains memory contents even when the power supply is turned off.

Supposed Causes

- Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2777)

2.3 "A3" Indoor Unit: Malfunction of Drain Level Control System (S1L)

Remote Controller Display

A3

Applicable Models

FXFQ, FXDQ, FXSQ, FXMQ, FXHQ, FXAQ

Method of Malfunction Detection

By float switch OFF detection

Malfunction Decision Conditions

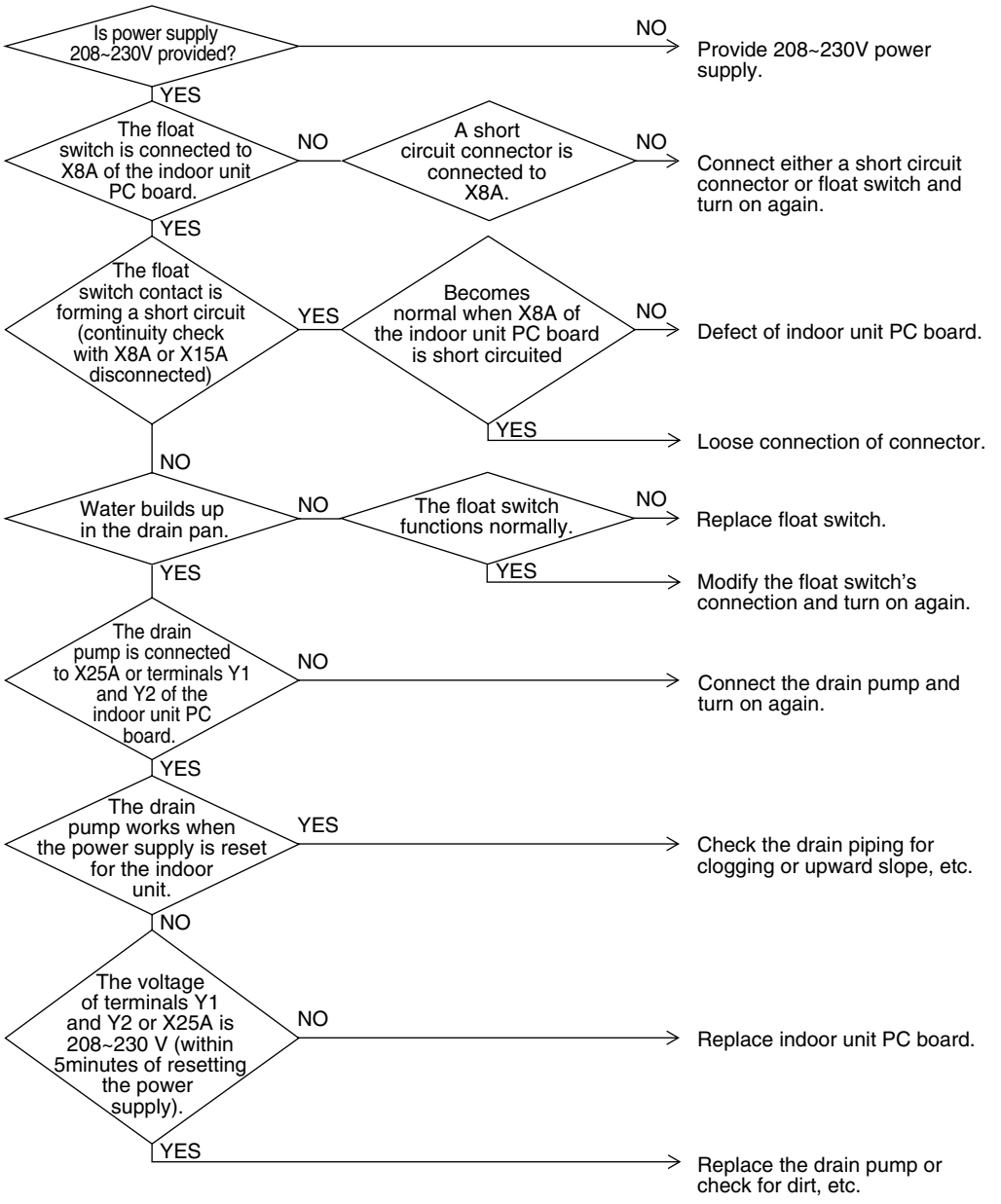
When rise of water level is not a condition and the float switch goes OFF.

Supposed Causes

- 208~230V power supply is not provided
- Defect of float switch or short circuit connector
- Defect of drain pump
- Drain clogging, upward slope, etc.
- Defect of indoor unit PC board
- Loose connection of connector

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2778)

2.4 "A6" Indoor Unit: Fan Motor (M1F) Lock, Overload

Remote Controller Display

A6

Applicable Models

All indoor unit models

Method of Malfunction Detection

Detection by failure of signal for detecting number of turns to come from the fan motor

Malfunction Decision Conditions

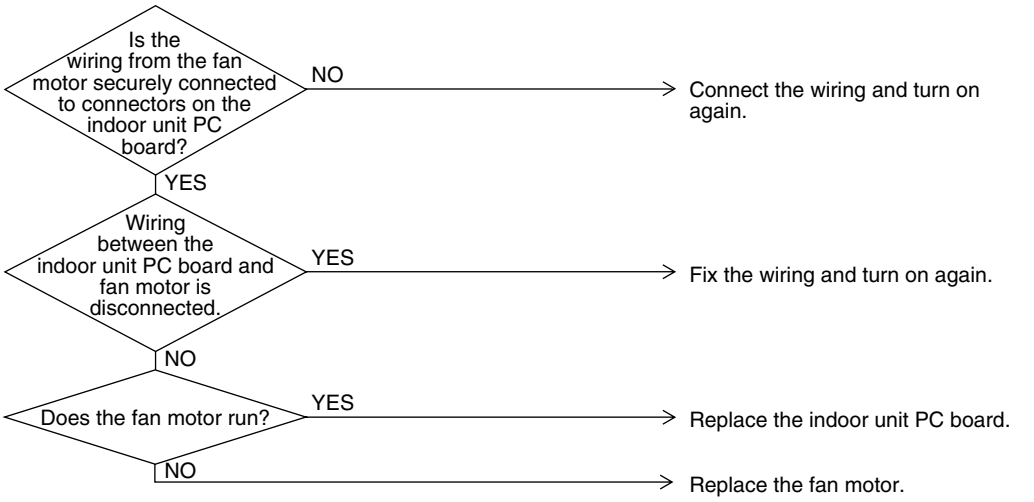
When number of turns can't be detected even when output voltage to the fan is maximum

Supposed Causes

- Fan motor lock
- Disconnected or faulty wiring between fan motor and PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



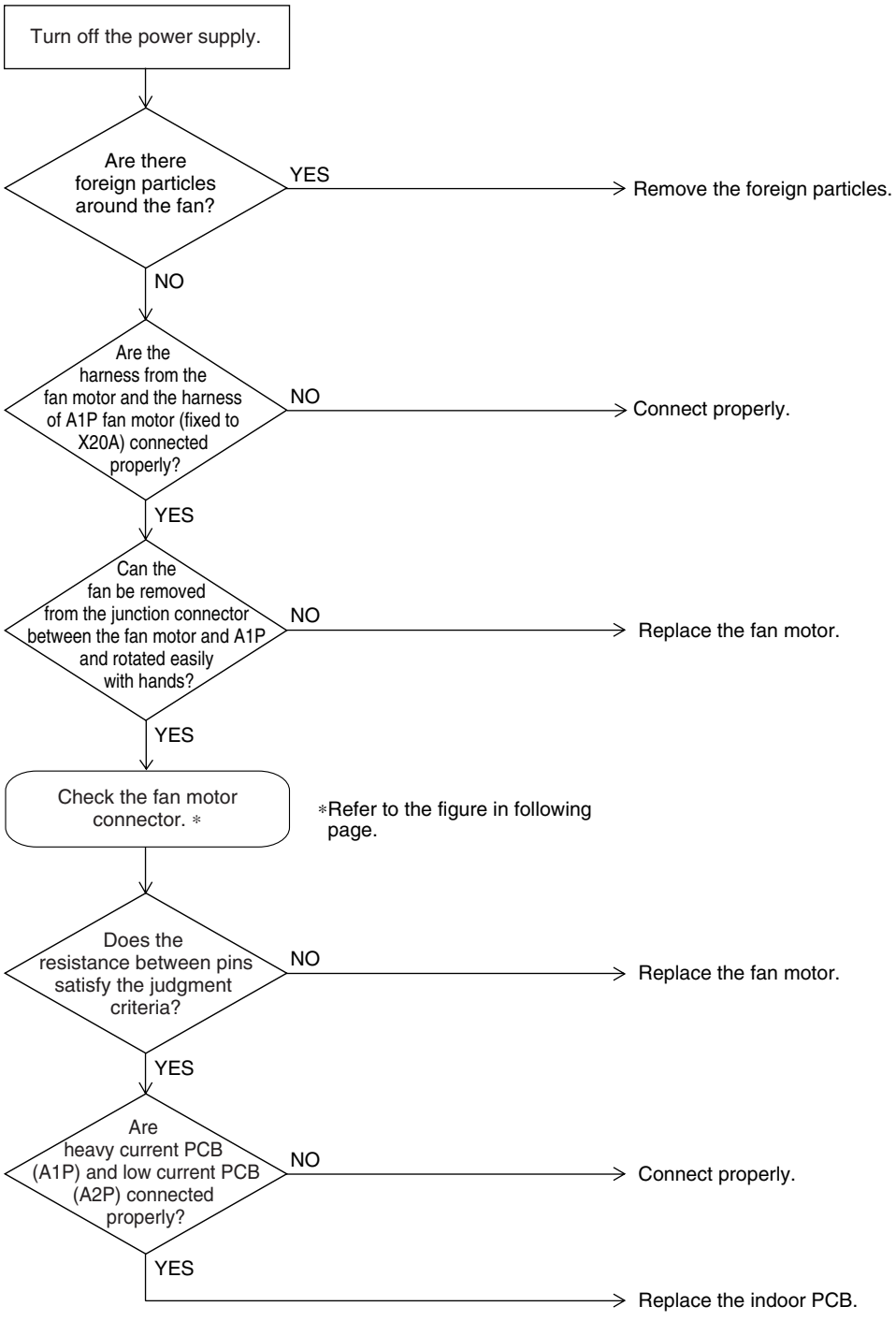
(V2779)

"A6" Abnormal Indoor Fan Motor

Remote Controller Display	A6
Applicable Models	FXFQ, FXAQ
Method of Malfunction Detection	Detect abnormal fan rotation with the signal from the fan motor
Malfunction Decision Conditions	When fan rotation does not increase
Supposed Causes	■ Disconnected/short-circuited fan motor harnesses or disconnected connectors ■ Faulty fan motor (Disconnection and insulation failure) ■ Abnormal signal from the fan motor (Circuit breakdown) ■ Faulty PCB ■ Instantaneous disturbance of power supply voltage ■ Fan motor lock (Caused by the motor or external factors) ■ Fan does not rotate because foreign particles are trapped in it. ■ Disconnected connector between PCBs A1P and A2P

Troubleshooting

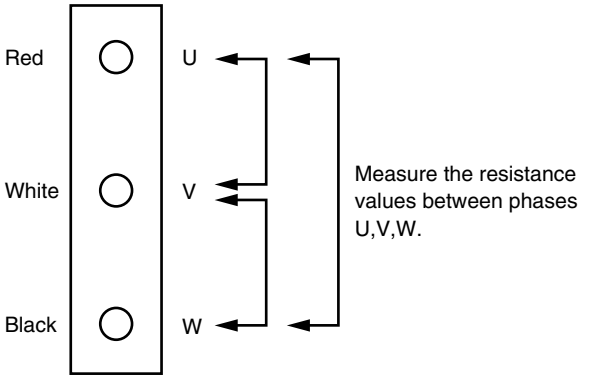
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



[Check on connector of fan motor (Power supply cable)]

(1)Turn off the power supply.

Measure the resistance between phases of U, V, W at the motor side connectors (three-core wire) to check that the values are balanced and there is no short circuiting, while connector or relay connector is disconnected.

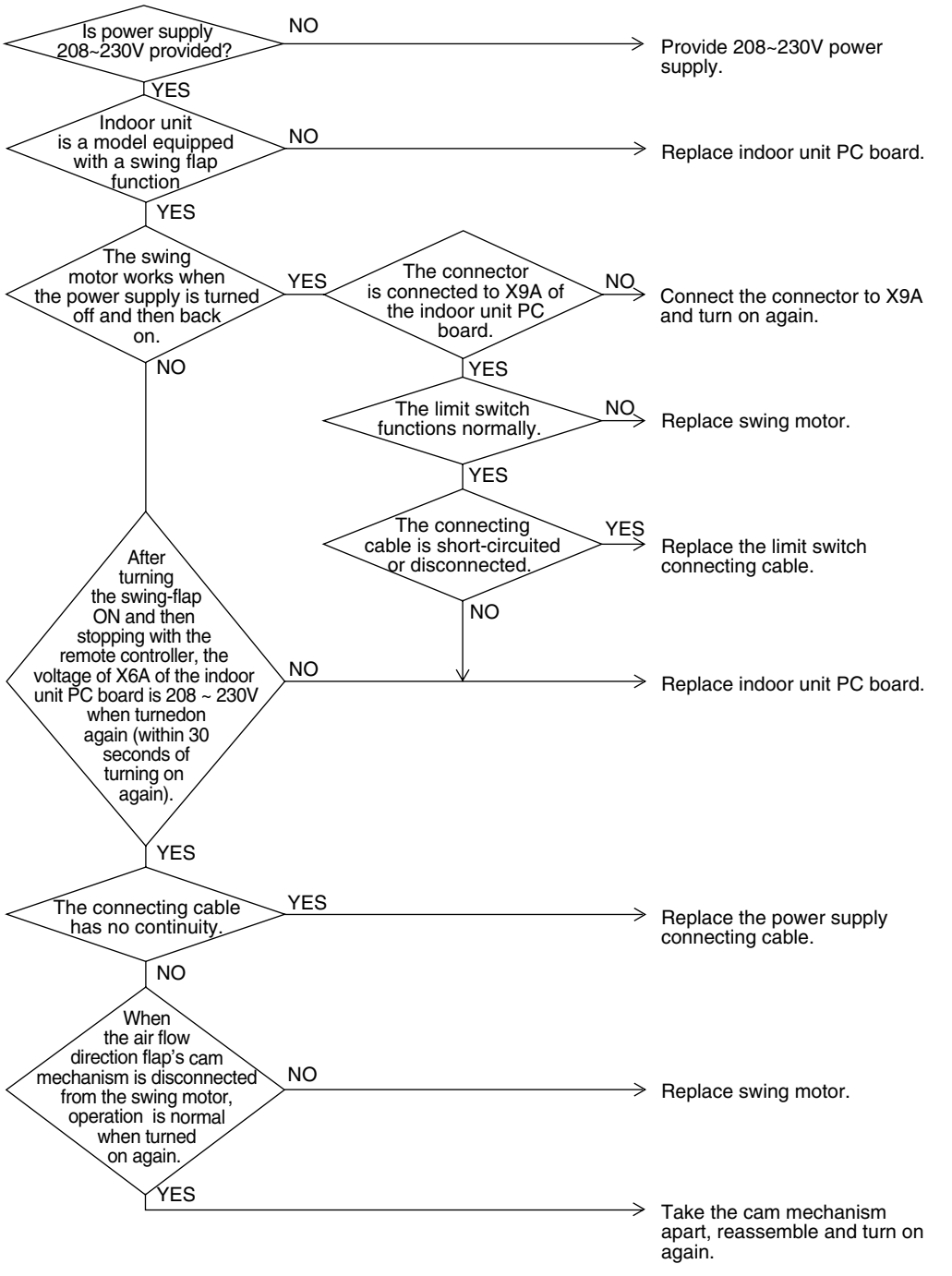


2.5 "A7" Indoor Unit: Malfunction of Swing Flap Motor (MA)

Remote Controller Display	A7
Applicable Models	FXHQ only
Method of Malfunction Detection	Utilizes ON/OFF of the limit switch when the motor turns.
Malfunction Decision Conditions	When ON/OFF of the microswitch for positioning cannot be reversed even though the swing flap motor is energized for a specified amount of time (about 30 seconds).
Supposed Causes	■ Defect of swing motor ■ Defect of connection cable (power supply and limit switch) ■ Defect of air flow direction adjusting flap-cam ■ Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2780)

2.6 "A9" Indoor Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E)

Remote Controller Display

A9

Applicable Models

All indoor unit models

Method of Malfunction Detection

Detection by failure of signal for detecting number of turns to come from the fan motor

Malfunction Decision Conditions

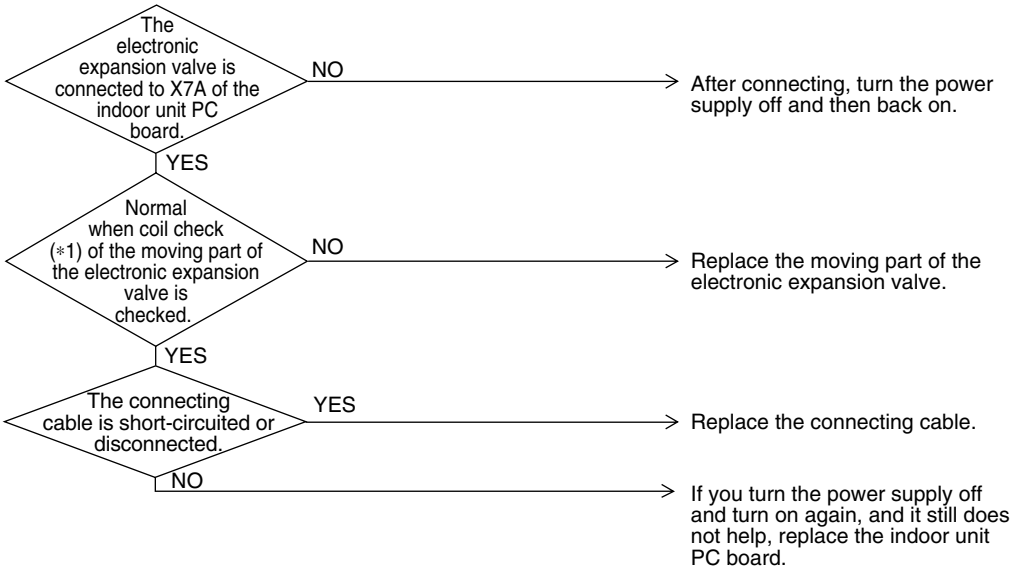
When number of turns can't be detected even when output voltage to the fan is maximum

Supposed Causes

- Malfunction of moving part of electronic expansion valve
- Defect of indoor unit PC board
- Defect of connecting cable

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



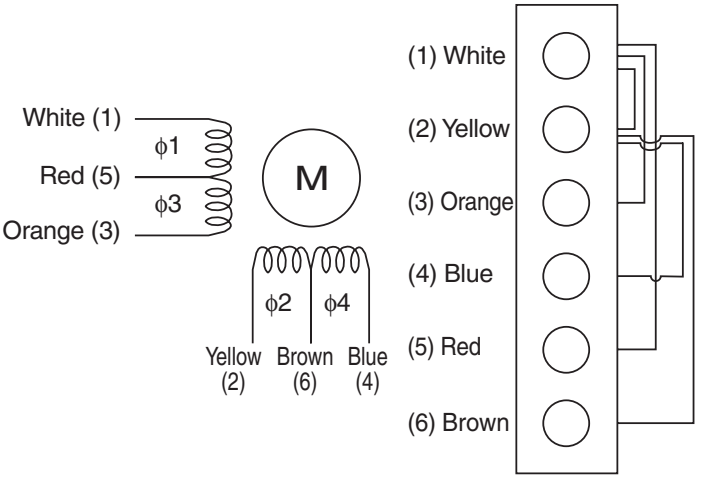
(V2781)

∗1: Coil check method for the moving part of the electronic expansion valve
Discount the electronic expansion valve from the PC board and check the continuity between the connector pins.

(Normal)

Pin No.	1. White	2. Yellow	3. Orange	4. Blue	5. Red	6. Brown
1. White		×	○ Approx. 300Ω	×	○ Approx. 150Ω	×
2. Yellow			×	○ Approx. 300Ω	×	○ Approx. 150Ω
3. Orange				×	○ Approx. 150Ω	×
4. Blue					×	○ Approx. 150Ω
5. Red						×
6. Brown						

○: Continuity
× : No continuity



2.7 "AF" Indoor Unit: Drain Level above Limit

Remote Controller Display

AF

Applicable Models

FXFQ, FXSQ, FXMQ, FXDQ

Method of Malfunction Detection

Water leakage is detected based on float switch ON/OFF operation while the compressor is in non-operation.

Malfunction Decision Conditions

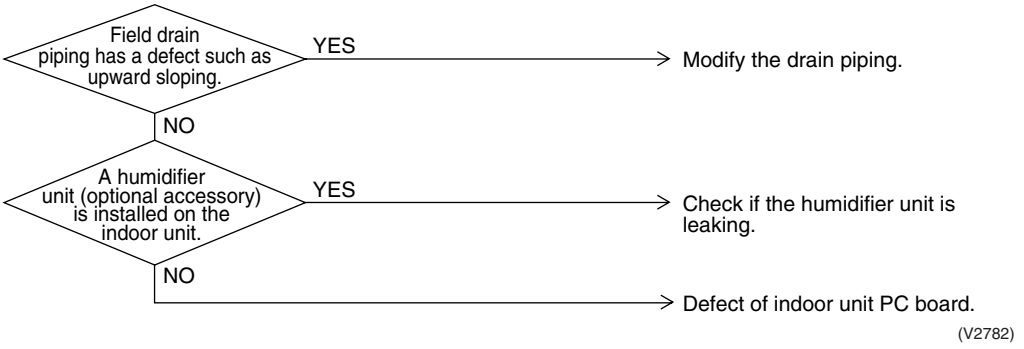
When the float switch changes from ON to OFF while the compressor is in non-operation.

Supposed Causes

- Humidifier unit (optional accessory) leaking
- Defect of drain pipe (upward slope, etc.)
- Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.8 "RJ" Indoor Unit: Malfunction of Capacity Determination Device

Remote controller display

RJ

Applicable Models

All indoor unit models

Method of Malfunction Detection

Capacity is determined according to resistance of the capacity setting adaptor and the memory inside the IC memory on the indoor unit PC board, and whether the value is normal or abnormal is determined.

Malfunction Decision Conditions

Operation and:

1. When the capacity code is not contained in the PC board's memory, and the capacity setting adaptor is not connected.
2. When a capacity that doesn't exist for that unit is set.

Supposed Causes

- You have forgotten to install the capacity setting adaptor.
- Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

(V2783)

2.9 "C4" Indoor Unit: Malfunction of Thermistor (R2T) for Heat Exchanger

Remote Controller Display

C4

Applicable Models

All indoor unit models

Method of Malfunction Detection

Malfunction detection is carried out by temperature detected by heat exchanger thermistor.

Malfunction Decision Conditions

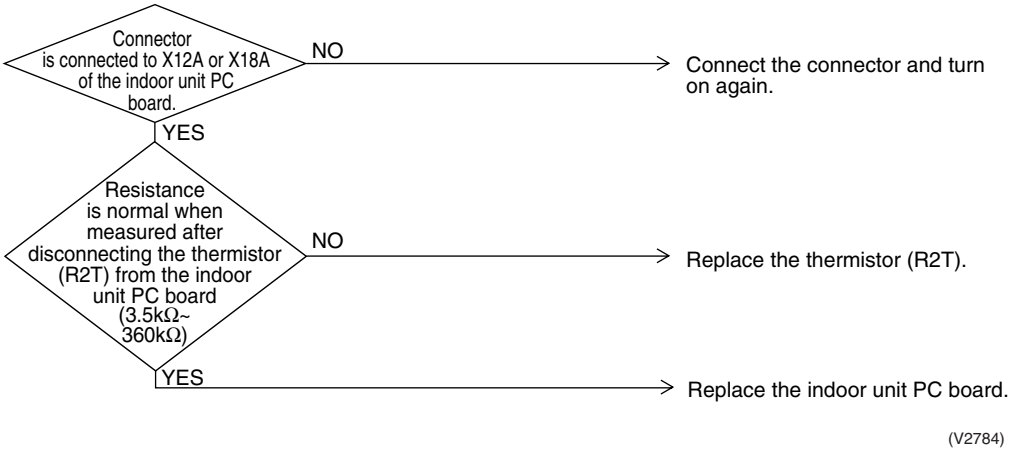
When the heat exchanger thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defect of thermistor (R2T) for liquid pipe
- Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗2: Refer to thermistor resistance / temperature characteristics table on P278.

2.10 "C5" Indoor Unit: Malfunction of Thermistor (R3T) for Gas Pipes

Remote Controller Display

C5

Applicable Models

All indoor unit models

Method of Malfunction Detection

Malfunction detection is carried out by temperature detected by gas pipe thermistor.

Malfunction Decision Conditions

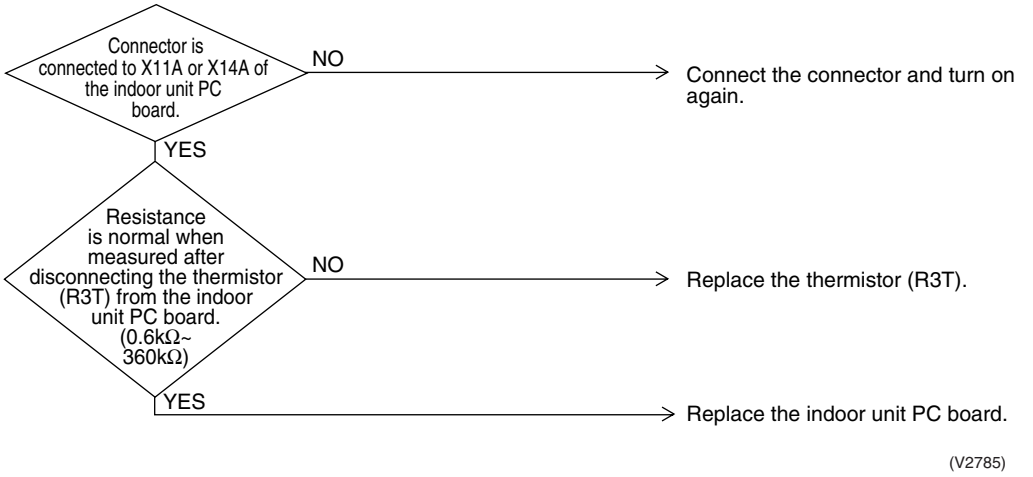
When the gas pipe thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defect of indoor unit thermistor (R3T) for gas pipe
- Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗2: Refer to thermistor resistance / temperature characteristics table on P278.

2.11 "C9" Indoor Unit: Malfunction of Thermistor (R1T) for Suction Air

Remote Controller Display

C9

Applicable Models

All indoor unit models

Method of Malfunction Detection

Malfunction detection is carried out by temperature detected by suction air temperature thermistor.

Malfunction Decision Conditions

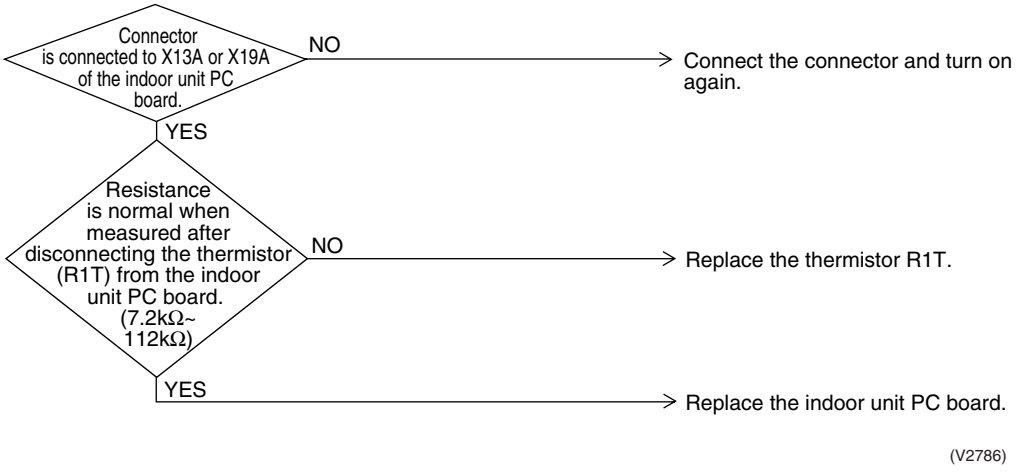
When the suction air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defect of indoor unit thermistor (R1T) for air inlet
- Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗2: Refer to thermistor resistance / temperature characteristics table on P278.

2.12 "CJ" Indoor Unit: Malfunction of Thermostat Sensor in Remote Controller

Remote Controller Display

CJ

Applicable Models

All indoor unit models

Method of Malfunction Detection

Malfunction detection is carried out by temperature detected by remote controller air temperature thermistor. (Note1)

Malfunction Decision Conditions

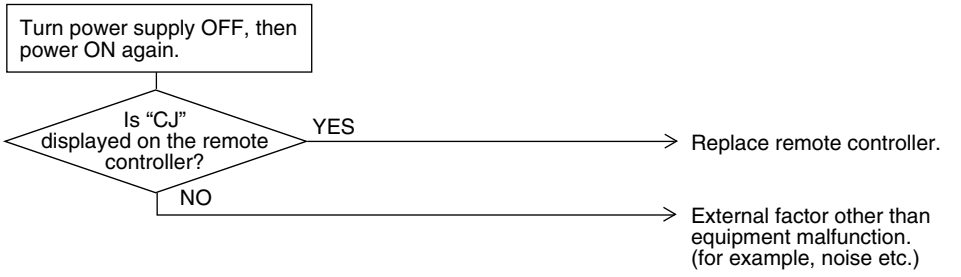
When the remote controller air temperature thermistor becomes disconnected or shorted while the unit is running.

Supposed Causes

- Defect of remote controller thermistor
- Defect of remote controller PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2787)

Note: In case of remote controller thermistor malfunction, unit is still operable by suction air thermistor on indoor unit.

∗2: Refer to thermistor resistance / temperature characteristics table on P278.

2.13 "E1" Outside Unit: PC Board Defect

Remote Controller Display

E1

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Detect abnormalities by checking communication status of the hard part between the indoor unit and outside unit.

Malfunction Decision Conditions

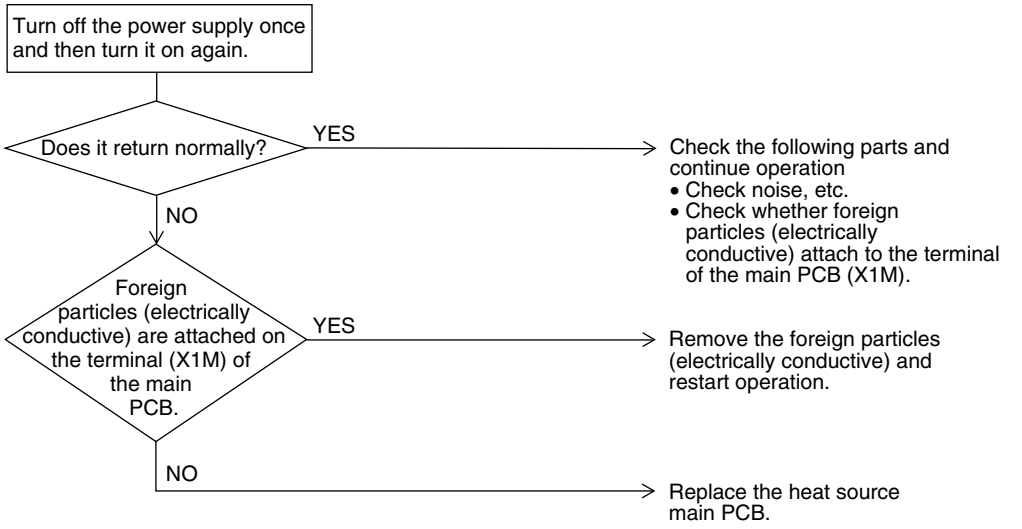
When communication status of the hard part between the indoor unit and heat source unit is abnormal

Supposed Causes

- Faulty main PCB
- Faulty communication part (photo coupler) on the main PCB

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.14 "E3" Outside Unit: Actuation of High Pressure Switch

Remote Controller Display	E3
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Detect conductive property of the high pressure switch with the protector circuit.
Malfunction Decision Conditions	When the protector circuit is partially opened (For reference) Working pressure for the high pressure switch Working pressure: 580psi Return pressure: 413psi
Supposed Causes	■ High pressure switch operation ■ Faulty high pressure switch ■ Faulty main PCB ■ Temporal power failure ■ Faulty high pressure sensor ■ Insufficient heat source water ■ Dirty water heat exchanger

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

Check the following items:
① Is the stop valve open?
② Is the connector for HPS properly connected to the main PCB?
③ Is the high pressure switch electrically conductive?

Are all of the above conditions satisfied? — NO → Improve defects.

YES

- Set up a pressure gauge in the high pressure service port.
- Connect the Service Checker.
- Restart operation after resetting operation with a remote controller.

Can the emergency stop (E3) be repeated? — YES → Is HPS working value (580psi) normal? — NO → Replace the HPS.

NO / YES

Are high pressure sensor characteristics normal? (∗1) — NO → Replace the high pressure sensor.

YES

Is PCB detector pressure normal? (∗2) — NO → Replace the main PCB.

YES

- The high pressure sensor is normal and the main PCB pressure detection is also normal.
- In fact, high pressure is rising.

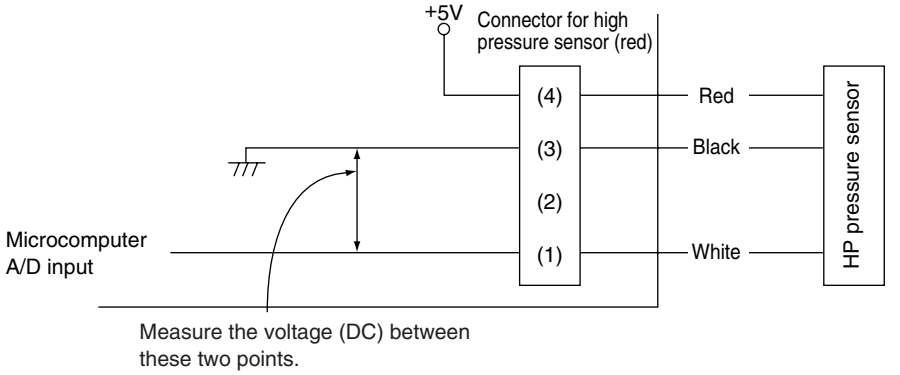
⇩

CHECK 1 : Refer to page 249 to eliminate the causes of high pressure rise.

∗1 : Compare the pressure sensor voltage measurements with pressure gauge readings. (For the pressure sensor, voltage is measured at the connector and converted to pressure in accordance with page 280.)

∗2 : Compare “high pressure” checked with the Service Checker with pressure sensor voltage measurements (refer to ∗1).

∗3 : Measure the voltage of the pressure sensor.

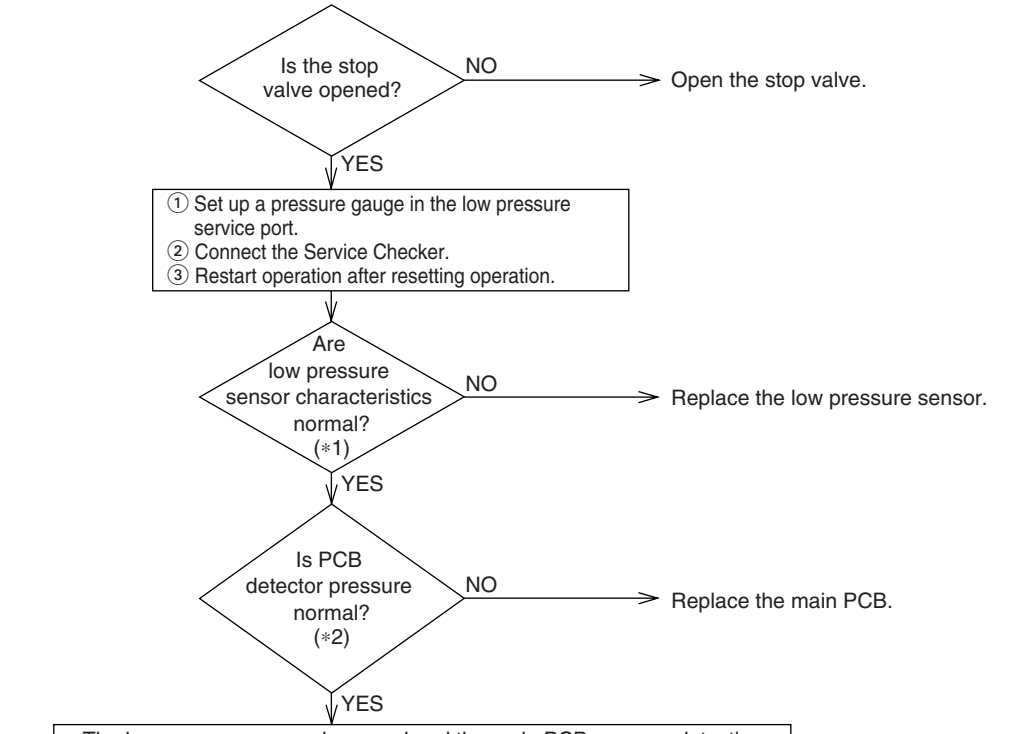


2.15 "E4" Outside Unit: Actuation of Low Pressure Sensor

Remote Controller Display	E4
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Judge the pressure detected by a low pressure sensor with the main PCB.
Malfunction Decision Conditions	When low pressure drops while the compressor is in operation Working pressure: 10.1psi (Retry: 3 times)
Supposed Causes	■ Abnormal low pressure drop ■ Faulty low pressure sensor ■ Faulty main PCB ■ The stop valve left closed ■ Insufficient heat source water ■ Dirty water heat exchanger

Troubleshooting

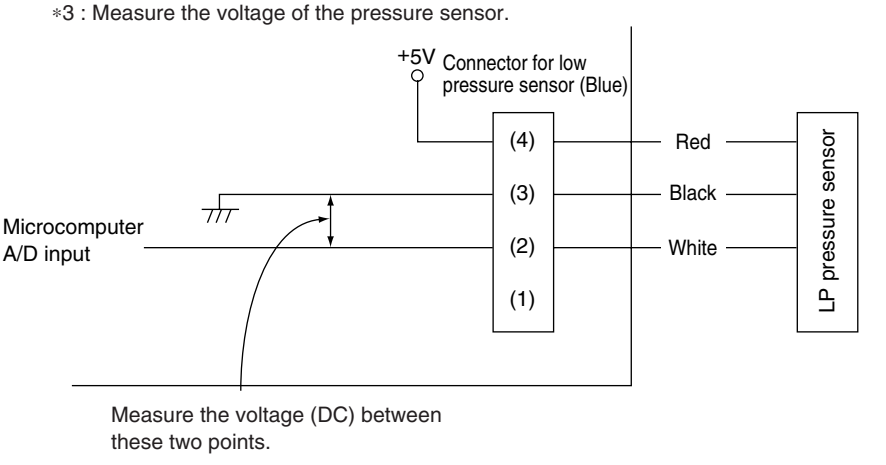
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1 : Compare the pressure sensor voltage measurements with pressure gauge readings. (For the pressure sensor, voltage is measured at the connector and converted to pressure in accordance with page 280.)

∗2 : Compare “low pressure” measured with the Service Checker with pressure sensor voltage measurements (refer to ∗1).

∗3 : Measure the voltage of the pressure sensor.

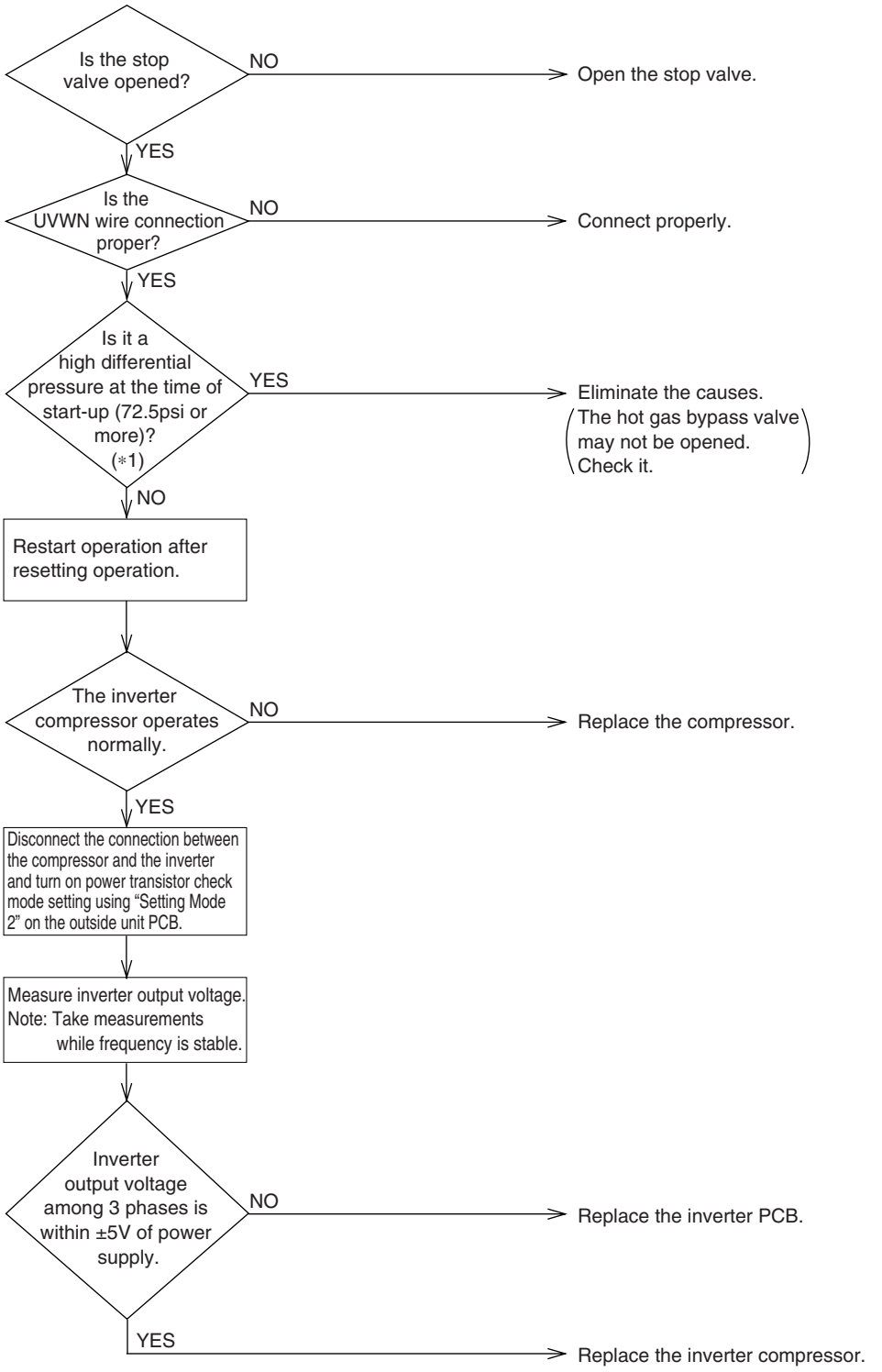


2.16 "E5" Compressor Motor Lock

Remote Controller Display	E5
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Pick up the location signal using the inverter PCB from the UVWN line connected between the inverter and the compressor and detect location signal pattern.
Malfunction Decision Conditions	In normal operation, location signal for a triple cycle of frequency applied, while in locked operation, it is a double cycle, and they are detected. (Retry twice/60 minutes)
Supposed Causes	■ Inverter compressor lock ■ High differential pressure (72.5psi or more) ■ Incorrect UVWN wire connection ■ Faulty inverter PCB ■ Stop valve left closed

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1 : Difference in pressure between high and low pressures before start-up
*2 : The quality of the power transistor diode module can be assessed also by means of measurement of resistance between terminals (page 281, 282).

2.17 "E9" Outside Unit: Malfunction of Moving Part of Electronic Expansion Valve (Y1E, Y3E)

Remote Controller Display

E9

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Check disconnection of connector
Check continuity of expansion valve coil

Malfunction Decision Conditions

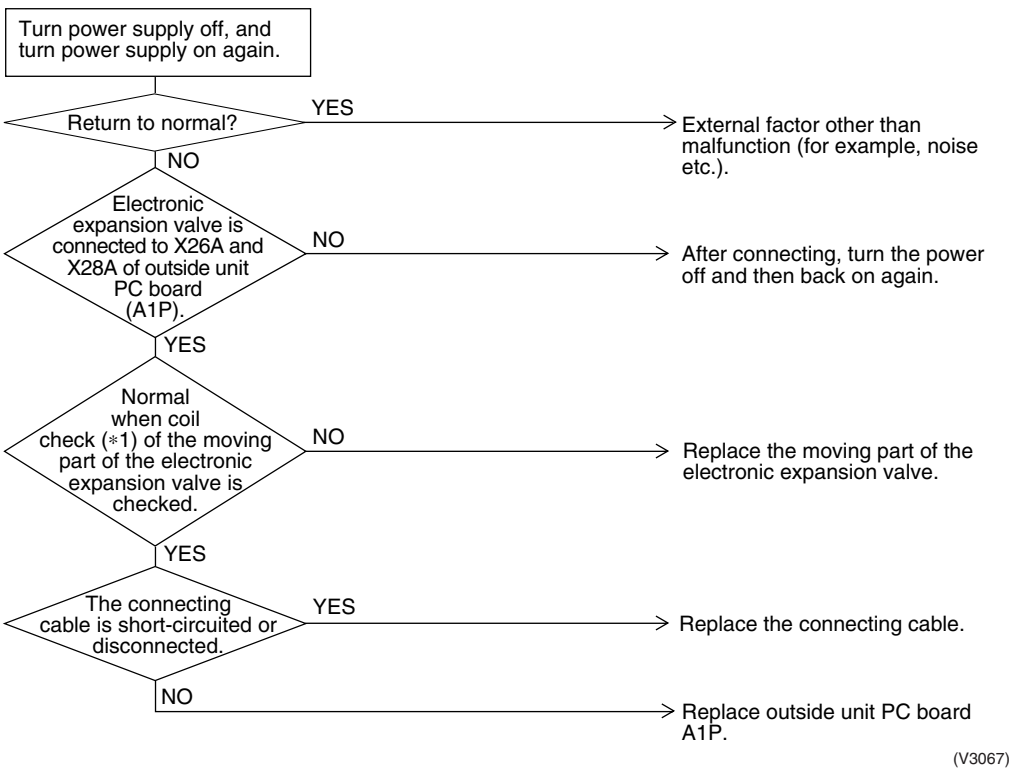
Error is generated under no common power supply when the power is on.

Supposed Causes

- Defect of moving part of electronic expansion valve
- Defect of outside unit PC board (A1P)
- Defect of connecting cable

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



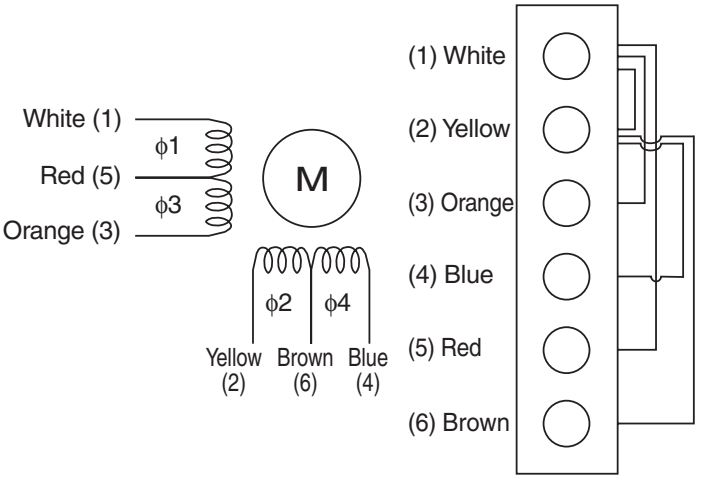
(V3067)

∗1: Coil check method for the moving part of the electronic expansion valve
Discount the electronic expansion valve from the PC board and check the continuity between the connector pins.

(Normal)

Pin No.	1. White	2. Yellow	3. Orange	4. Blue	5. Red	6. Brown
1. White		×	○ Approx. 300Ω	×	○ Approx. 150Ω	×
2. Yellow			×	○ Approx. 300Ω	×	○ Approx. 150Ω
3. Orange				×	○ Approx. 150Ω	×
4. Blue					×	○ Approx. 150Ω
5. Red						×
6. Brown						

○: Continuity
× : No continuity



2.18 "F3" Outside Unit: Abnormal Discharge Pipe Temperature

Remote Controller Display

F3

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Abnormality is detected according to the temperature detected by the discharge pipe temperature sensor.

Malfunction Decision Conditions

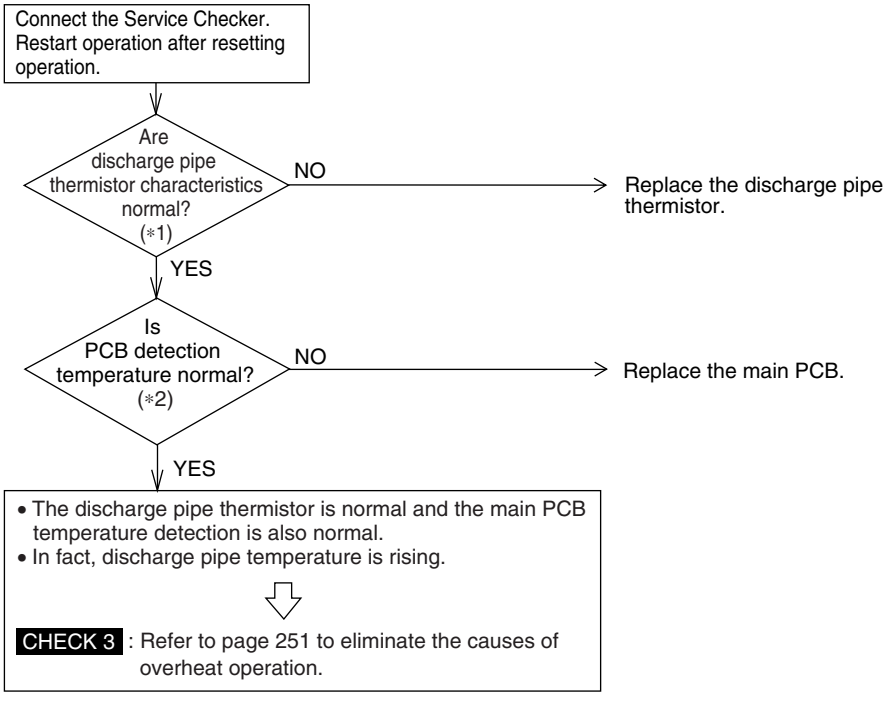
- When the discharge pipe temperature rises to an abnormally high level (over 135°C)
- When the discharge pipe temperature rises suddenly (over 120°C continues 10 min.)

Supposed Causes

- Faulty discharge pipe temperature sensor
- Faulty connection of discharge pipe temperature sensor
- Faulty outdside unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*1: Compare the resistance values of the discharge pipe thermistor with measurements of a surface thermometer.
(For temperature and resistance characteristics of a thermistor, refer to page 278, 279.)

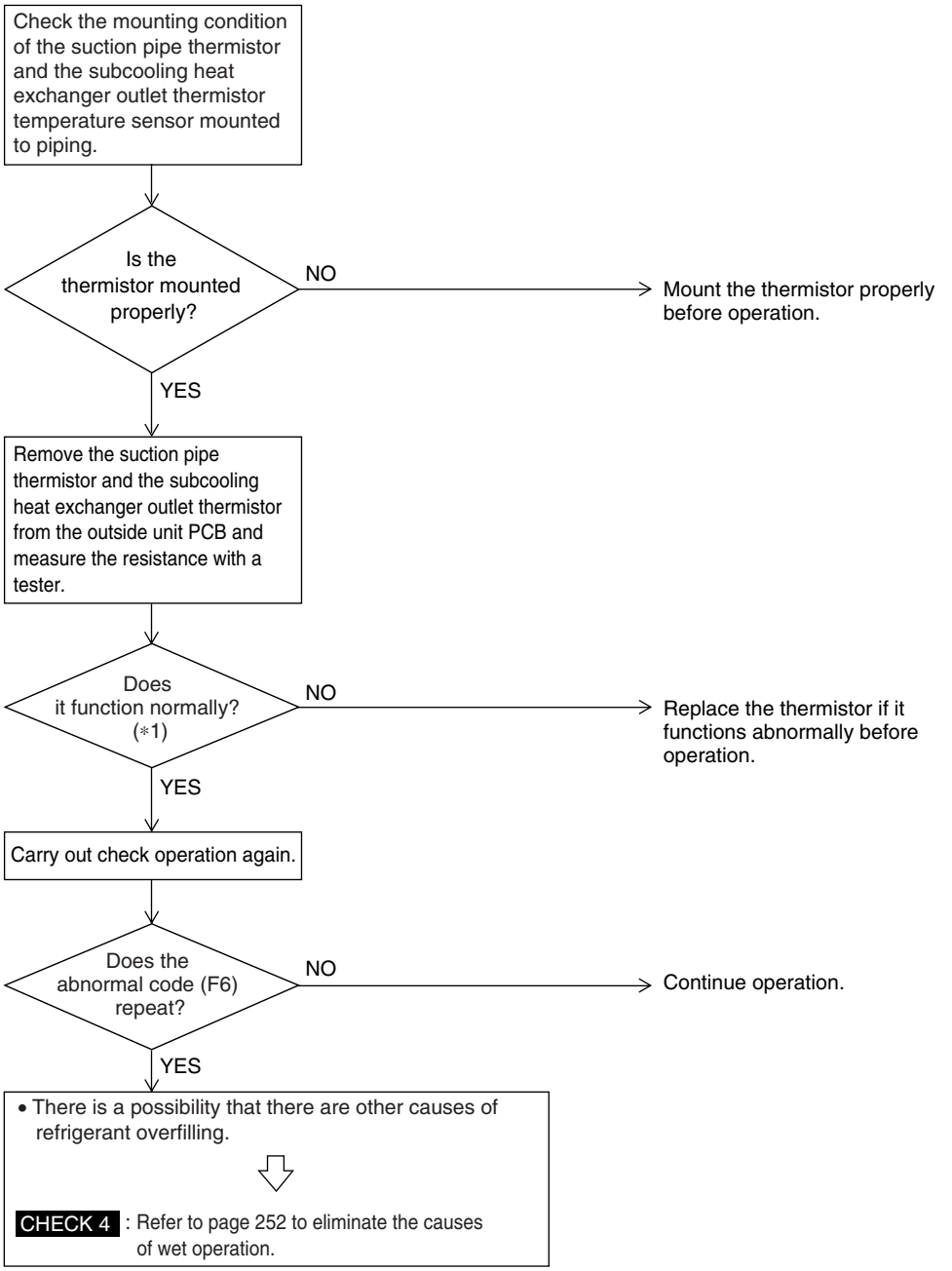
*2: Compare the discharge pipe temperature checked by the Service Checker with the resistance of the thermistor (refer to *1).

2.19 "F6" Refrigerant Overcharged

Remote Controller Display	F6
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Detect excessive charging of refrigerant using suction pipe temperature and subcooling heat exchanger outlet temperature during check operation.
Malfunction Decision Conditions	When the suction pipe temperature and the subcooling heat exchanger outlet temperature during check operation drop and become below the evaporation temperature
Supposed Causes	■ Excessive refrigerant charging ■ Suction pipe thermistor removed ■ Subcooling heat exchanger outlet thermistor removed

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



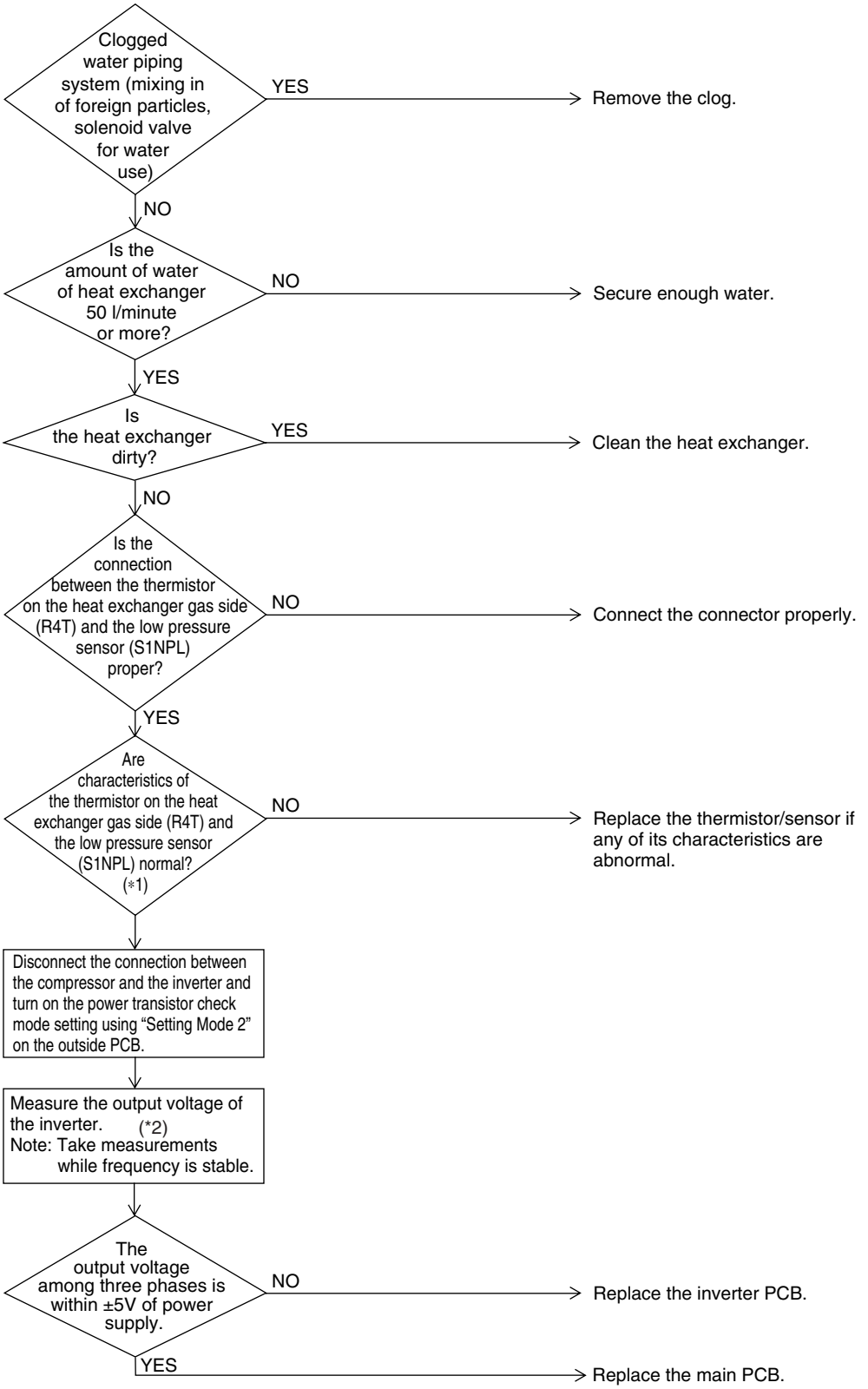
∗1: For thermistor temperature and resistance characteristics, refer to page 278, 279.

2.20 "HJ" Malfunction of Water system

Remote Controller Display	HJ
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	■ Detect abnormalities using the thermistor on the side of the heat exchanger gas. ■ Detect turned off interlock circuit. (When interlock setting is provided.)
Malfunction Decision Conditions	■ When temperature on the heat exchanger gas side (R4T) drops remarkably with the smallest operation step (52 Hz) of the compressor ■ With interlock setting provided, when interlock circuit is turned off.
Supposed Causes	■ Clogged water piping system ■ Insufficient heat exchanger water ■ Dirty heat exchanger ■ Disconnected connector ■ Faulty thermistor on the heat exchanger gas side ■ Faulty low pressure sensor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1 : For thermistor/sensor characteristics, refer to page 278, 279.

∗2 : The quality of the power transistor diode module can be assessed by means of measurement of resistance between terminals (page 281, 282).

2.21 "J3" Outside Unit: Malfunction of Discharge Pipe Thermistor (R3T)

Remote Controller Display

J3

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Malfunction is detected from the temperature detected by discharge pipe temperature thermistor.

Malfunction Decision Conditions

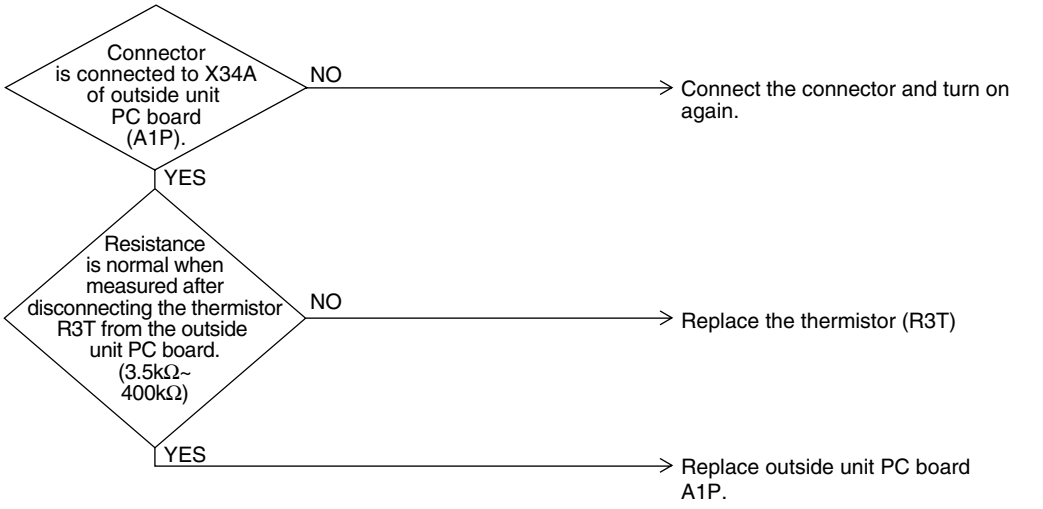
When a short circuit or an open circuit in the discharge pipe temperature thermistor is detected.

Supposed Causes

- Defect of thermistor (R3T) for outside unit discharge pipe
- Defect of outside unit PC board (A1P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3072)

2.22 "J4" Malfunction of Heat Exchanger Gas Pipe Thermistor (R4T)

Remote Controller Display

J4

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Malfunction is detected according to the temperature detected by heat exchanger gas pipe thermistor.

Malfunction Decision Conditions

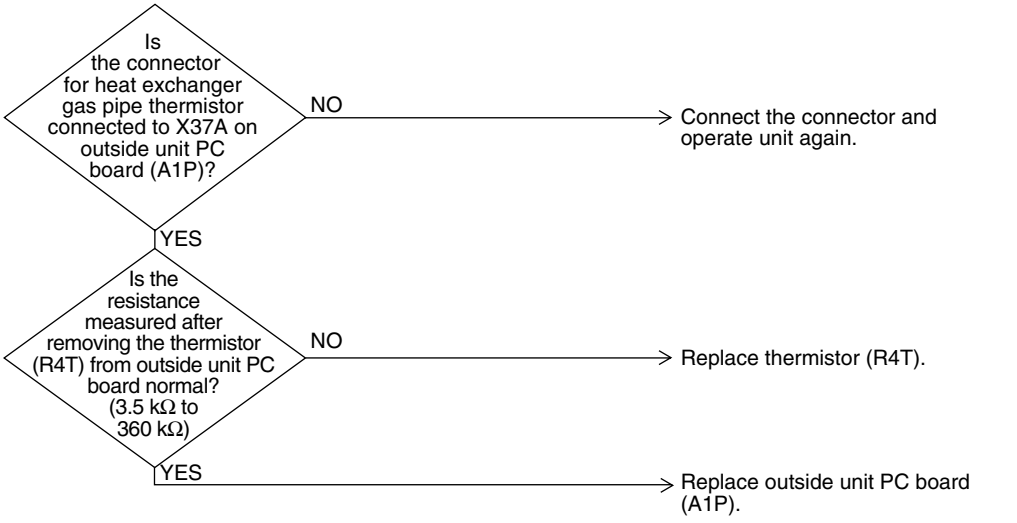
When the heat exchanger gas pipe thermistor is short circuited or open.

Supposed Causes

- Faulty heat exchanger gas pipe thermistor (R4T)
- Faulty outside unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3075)

∗2: Refer to thermistor resistance / temperature characteristics table on P.278.

2.23 "J5" Outside Unit: Malfunction of Thermistor (R2T) for Suction Pipe

Remote Controller Display

J5

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Malfunction is detected from the temperature detected by the suction pipe temperature thermistor.

Malfunction Decision Conditions

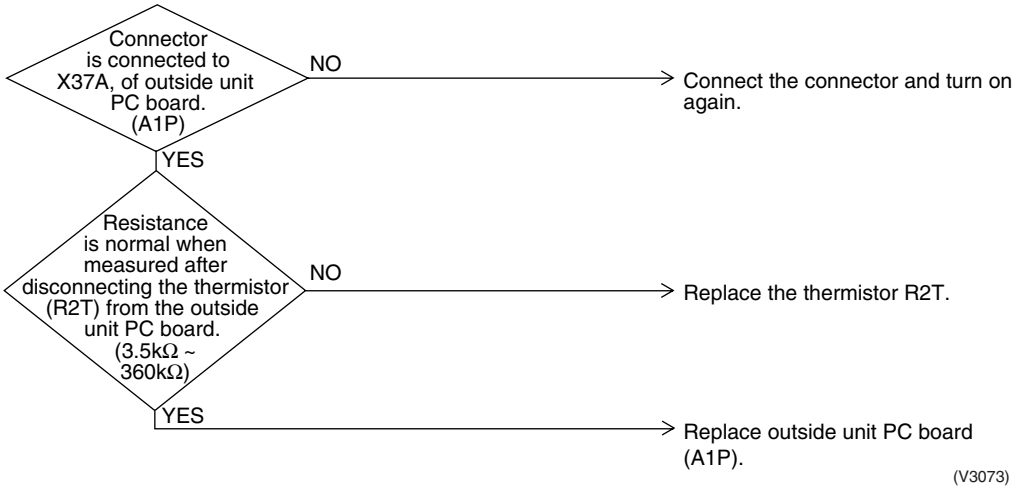
When a short circuit or an open circuit in the suction pipe temperature thermistor is detected.

Supposed Causes

- Defect of thermistor (R2T) for outside unit suction pipe
- Defect of outside unit PC board (A1P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗2: Refer to thermistor resistance / temperature characteristics table on P278.

2.24 "J7" Malfunction of Liquid Pipe Thermistor (R6T)

Remote Controller Display

J7

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Malfunction is detected according to the temperature detected by receiver outlet liquid pipe thermistor.

Malfunction Decision Conditions

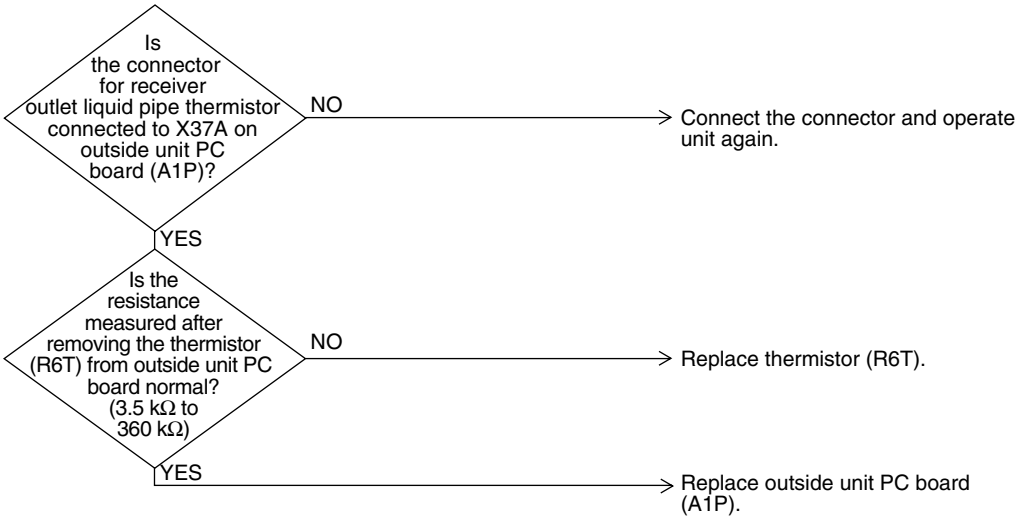
When the liquid pipe thermistor is short circuited or open.

Supposed Causes

- Faulty liquid pipe thermistor (R6T)
- Faulty outside unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V3075)

∗2: Refer to thermistor resistance / temperature characteristics table on P278.

2.25 "J9" Malfunction of Sub Cooling Heat Exchanger Outlet Thermistor (R5T)

Remote Controller Display

J9

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Malfunction is detected according to the temperature detected by sub cooling heat exchanger outlet thermistor.

Malfunction Decision Conditions

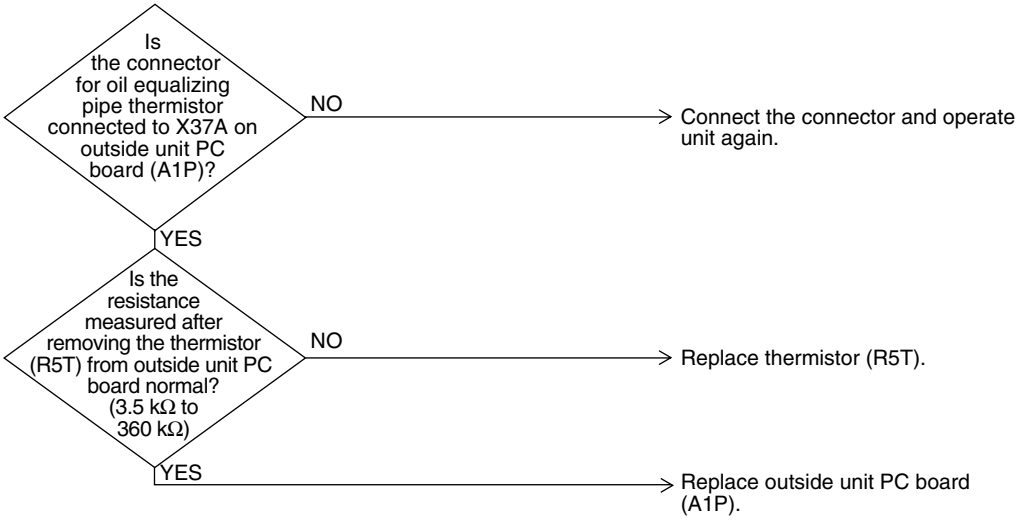
When the sub cooling heat exchanger outlet thermistor is short circuited or open.

Supposed Causes

- Faulty receiver gas pipe thermistor (R5T)
- Faulty outside unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



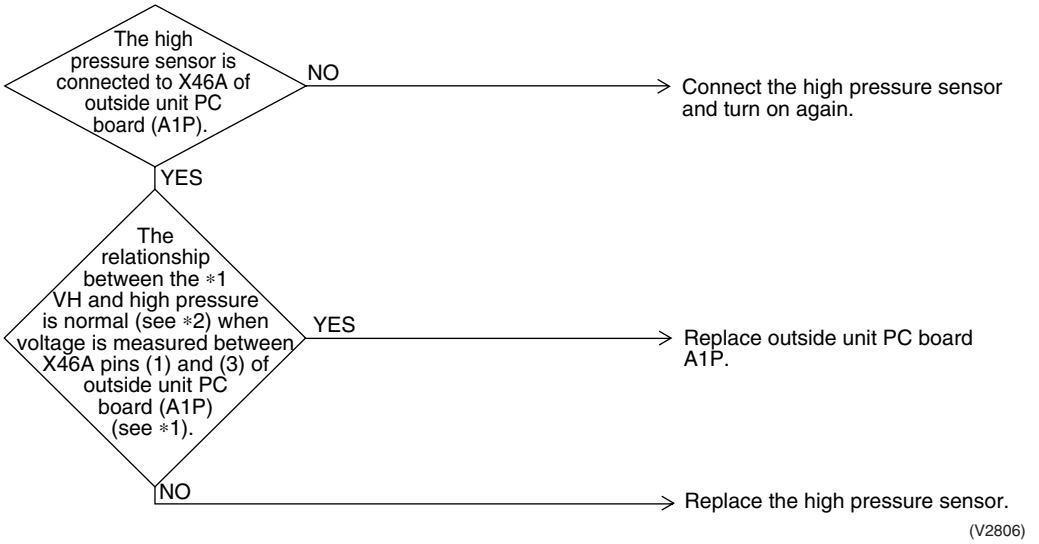
∗2: Refer to thermistor resistance / temperature characteristics table on P278.

2.26 "JA" Outside Unit: Malfunction of Discharge Pipe Pressure Sensor

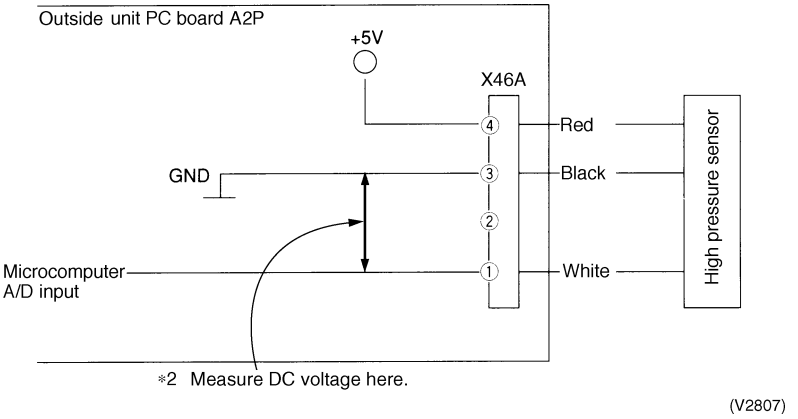
Remote Controller Display	JA
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Malfunction is detected from the pressure detected by the high pressure sensor.
Malfunction Decision Conditions	When the discharge pipe pressure sensor is short circuit or open circuit.
Supposed Causes	■ Defect of high pressure sensor system ■ Connection of low pressure sensor with wrong connection. ■ Defect of outside unit PC board.

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Voltage measurement point



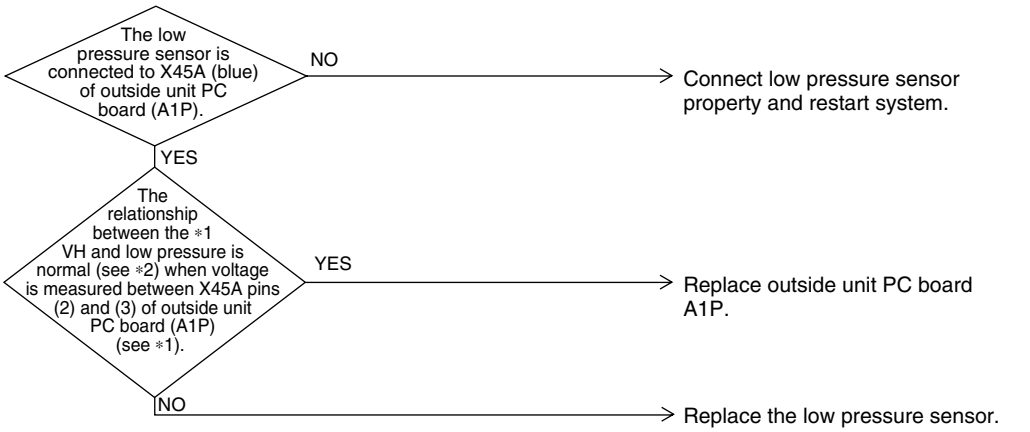
∗2: Refer to pressure sensor, pressure / voltage characteristics table on P280.

2.27 "JC" Outside Unit: Malfunction of Suction Pipe Pressure Sensor

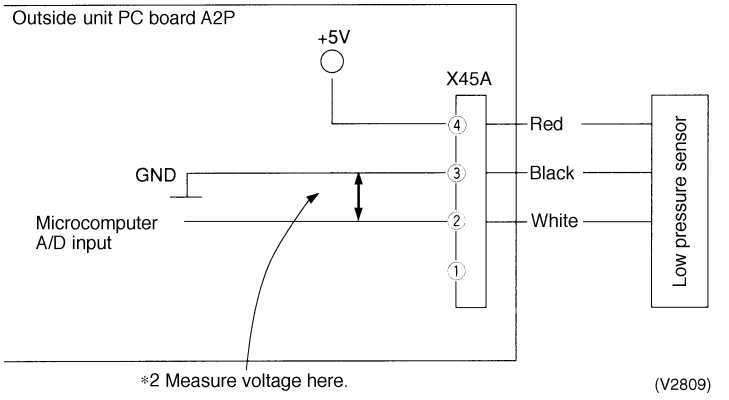
Remote Controller Display	JC
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Malfunction is detected from pressure detected by low pressure sensor.
Malfunction Decision Conditions	When the suction pipe pressure sensor is short circuit or open circuit.
Supposed Causes	■ Defect of low pressure sensor system ■ Connection of high pressure sensor with wrong connection. ■ Defect of outside unit PC board.

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗1: Voltage measurement point



∗2: Refer to pressure sensor, pressure / voltage characteristics table on P280.

2.28 "L1" Outdoor Unit: Malfunction of PC Board

Remote Controller Display

L1

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

- Detect malfunctions by current value during waveform output before compressor startup.
- Detect malfunctions by current sensor value during synchronized operation at the time of startup.

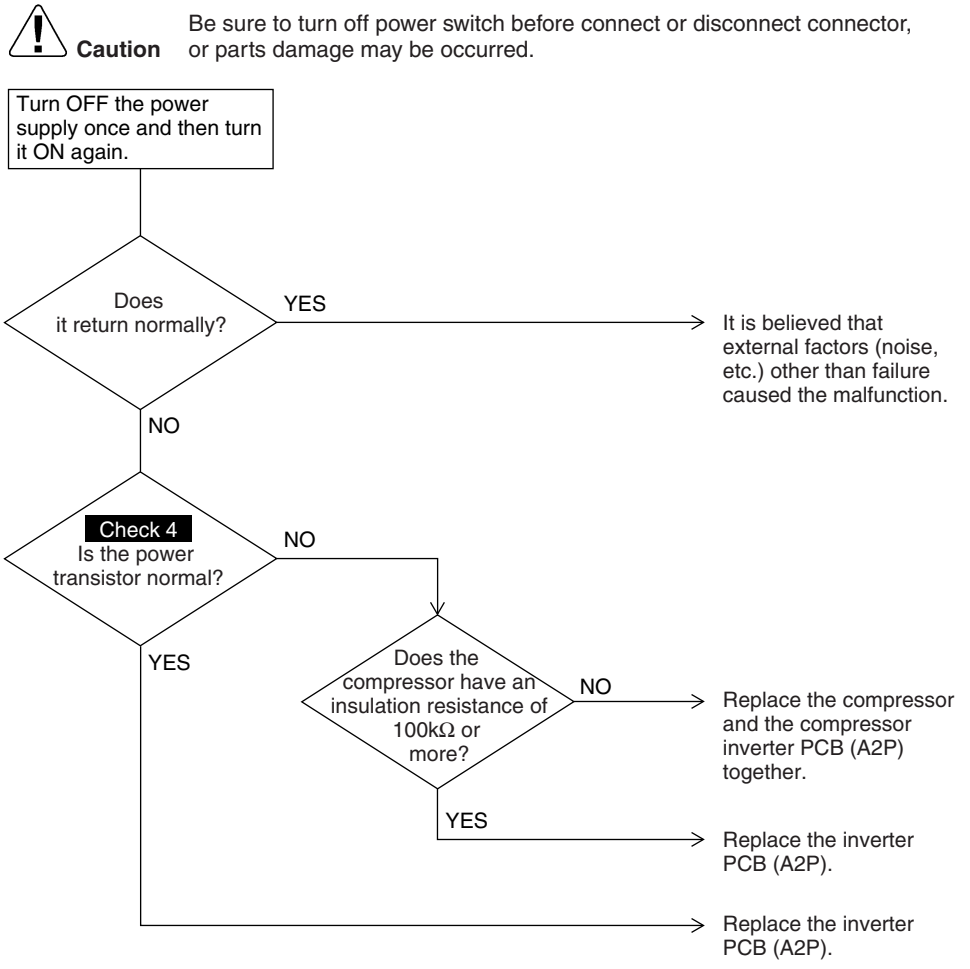
Malfunction Decision Conditions

- In case of overcurrent (OCP) during waveform output
- When the current sensor malfunctions during synchronized operation
- In case of IPM malfunction

Supposed Causes

- Faulty outdoor PC board (A2P)
  - IPM failure
  - Current sensor failure
  - Failure of drive circuit

Troubleshooting



2.29 "L4" Outside Unit: Malfunction of Inverter Radiating Fin Temperature Rise (R1T)

Remote Controller Display

L4

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Fin temperature is detected by the thermistor of the radiation fin.

Malfunction Decision Conditions

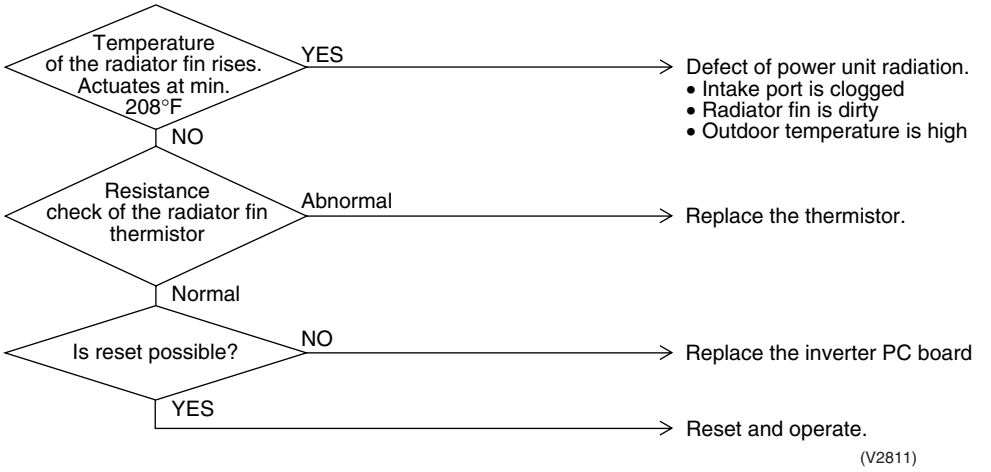
When the temperature of the inverter radiation fin increases above 98°C.

Supposed Causes

- Actuation of fin thermal (Actuates above 98°C)
- Defect of inverter PC board
- Defect of fin thermistor

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗2: Refer to thermistor resistance / temperature characteristics table on P278.

2.30 "L5" Outside Unit: Inverter Compressor Abnormal

Remote Controller Display

L5

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Malfunction is detected from current flowing in the power transistor.

Malfunction Decision Conditions

When an excessive current flows in the power transistor.
(Instantaneous overcurrent also causes activation.)

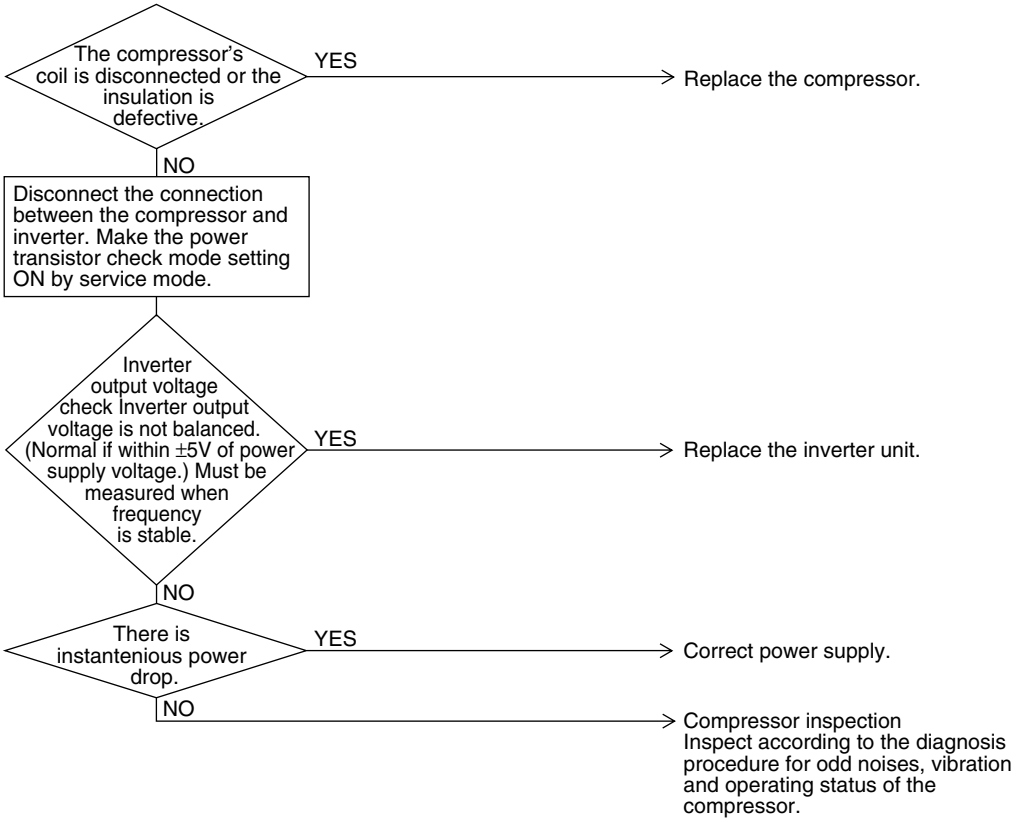
Supposed Causes

- Defect of compressor coil (disconnected, defective insulation)
- Compressor start-up malfunction (mechanical lock)
- Defect of inverter PC board

Troubleshooting

Compressor inspection

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

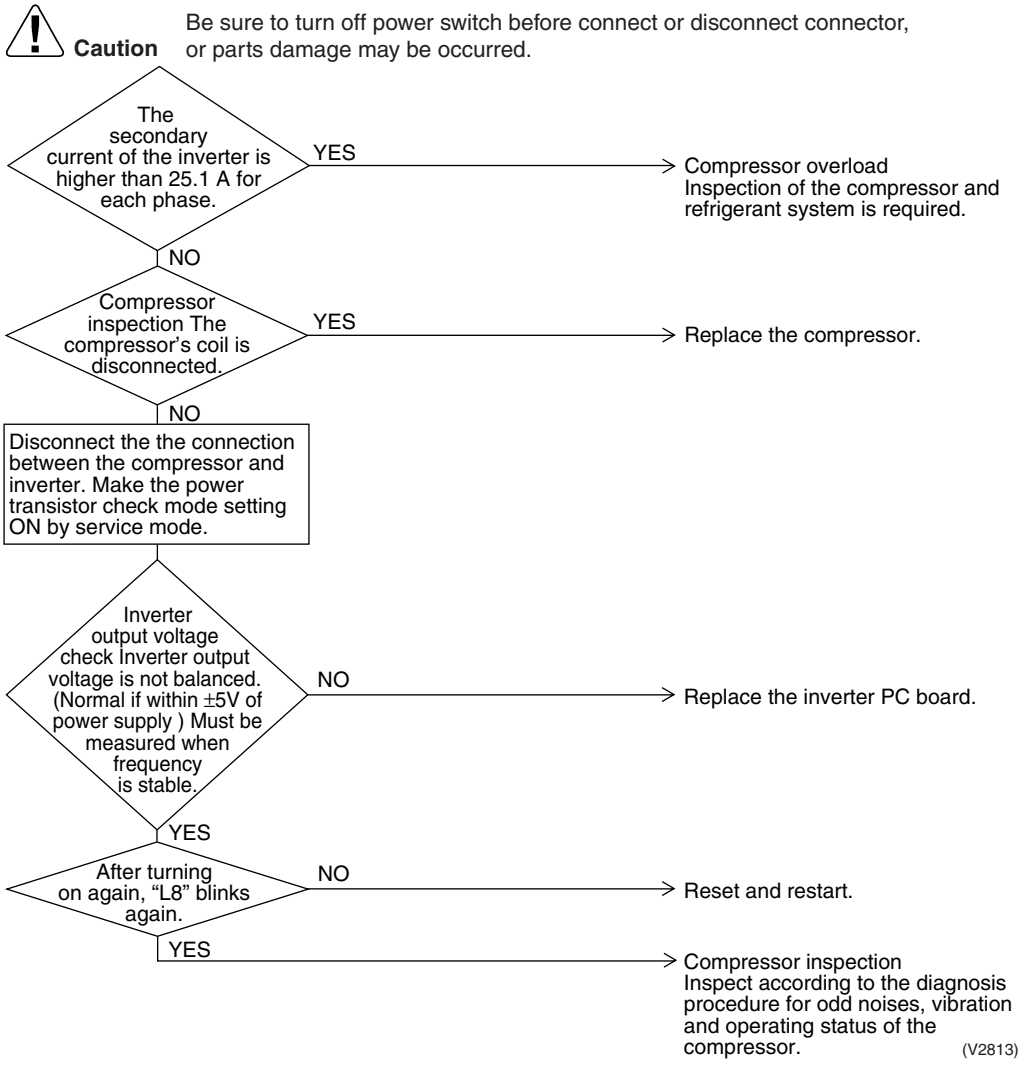


Higher voltage than actual is displayed when the inverter output voltage is checked by tester.

2.31 "L8" Outside Unit: Inverter Current Abnormal

Remote Controller Display	L8
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Malfunction is detected by current flowing in the power transistor.
Malfunction Decision Conditions	When overload in the compressor is detected.
Supposed Causes	■ Compressor overload ■ Compressor coil disconnected ■ Defect of inverter PC board

Troubleshooting Output current check



Higher voltage than actual is displayed when the inverter output voltage is checked by tester.

2.32 "L9" Outside Unit: Inverter Start up Error

Remote Controller Display

L9

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Malfunction is detected from current flowing in the power transistor.

Malfunction Decision Conditions

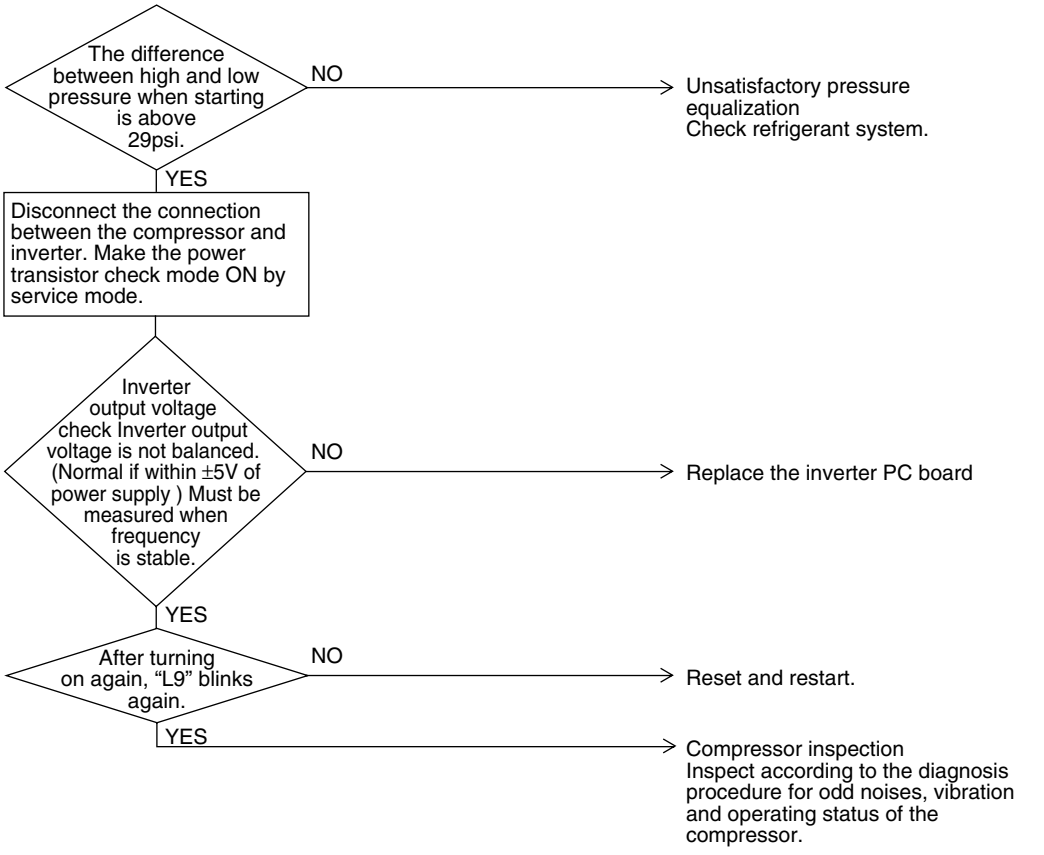
When overload in the compressor is detected during startup

Supposed Causes

- Defect of compressor
- Pressure differential start
- Defect of inverter PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2814)

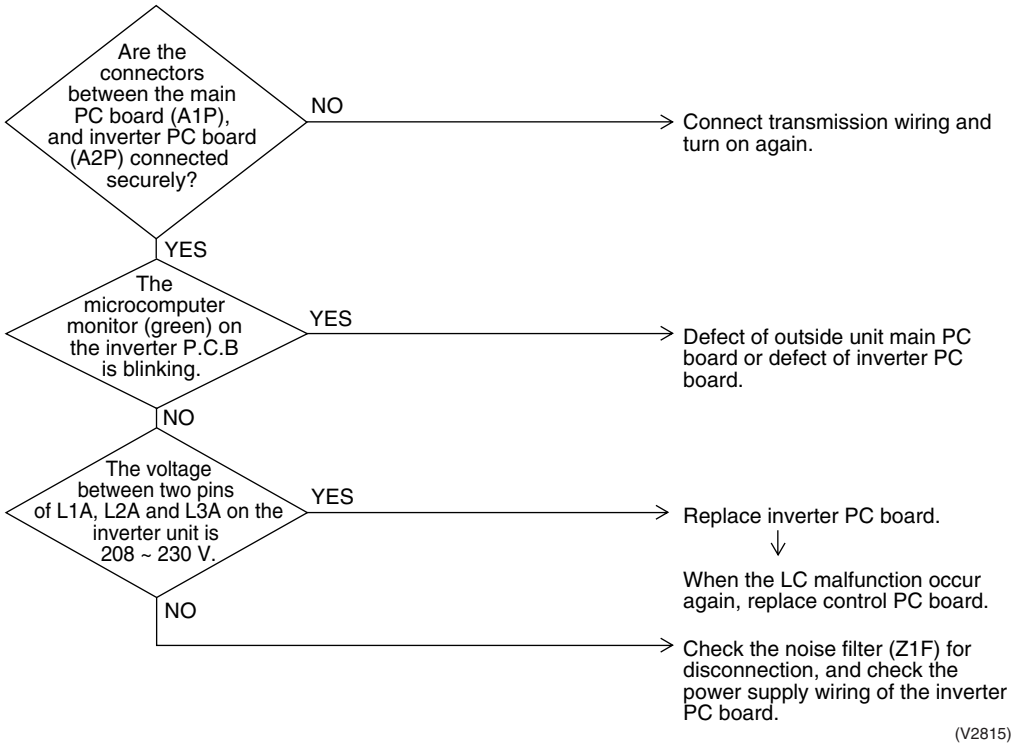
Higher voltage than actual is displayed when the inverter output voltage is checked by tester.

2.33 "LC" Outside Unit: Malfunction of Transmission between Inverter and Control PC Board

Remote Controller Display	LC
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Check the communication state between inverter PC board and control PC board by micro-computer.
Malfunction Decision Conditions	When the correct communication is not conducted in certain period.
Supposed Causes	■ Malfunction of connection between the inverter PC board and outside unit control PC board ■ Defect of outside unit control PC board (transmission section) ■ Defect of inverter PC board ■ Defect of noise filter ■ External factor (Noise etc.)

Troubleshooting

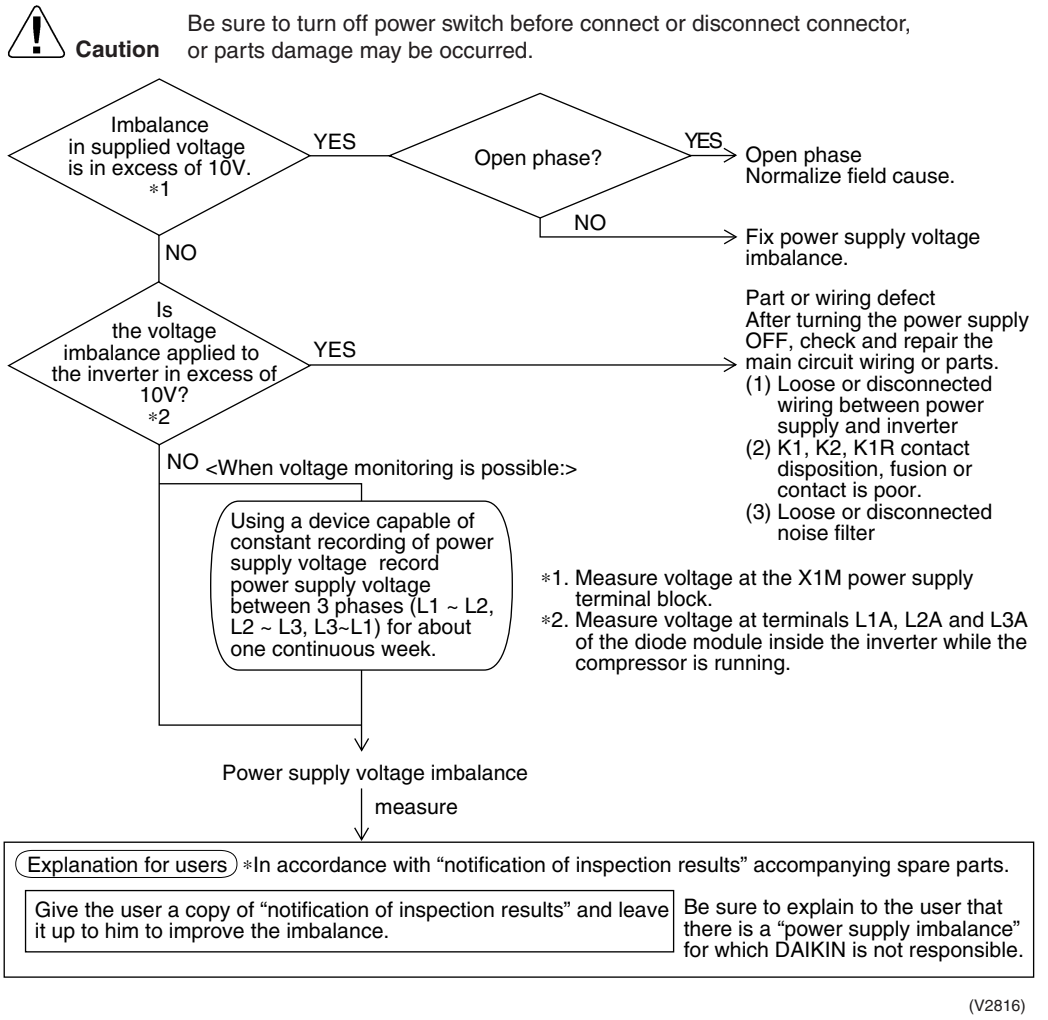
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.34 "P1" Outside Unit: Inverter Over-Ripple Protection

Remote Controller Display	P1
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Imbalance in supply voltage is detected in PC board.
Malfunction Decision Conditions	When the resistance value of thermistor becomes a value equivalent to open or short circuited status. ■ Malfunction is not decided while the unit operation is continued. "P1" will be displayed by pressing the inspection button.
Supposed Causes	■ Open phase ■ Voltage imbalance between phases ■ Defect of main circuit capacitor ■ Defect of inverter PC board ■ Defect of K1, K2 or K1R ■ Improper main circuit wiring

Troubleshooting



(V2816)

2.35 "P4" Outside Unit: Malfunction of Inverter Radiating Fin Temperature Sensor

Remote Controller Display

P4

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Resistance of radiation fin thermistor is detected when the compressor is not operating.

Malfunction Decision Conditions

When the resistance value of thermistor becomes a value equivalent to open or short circuited status.

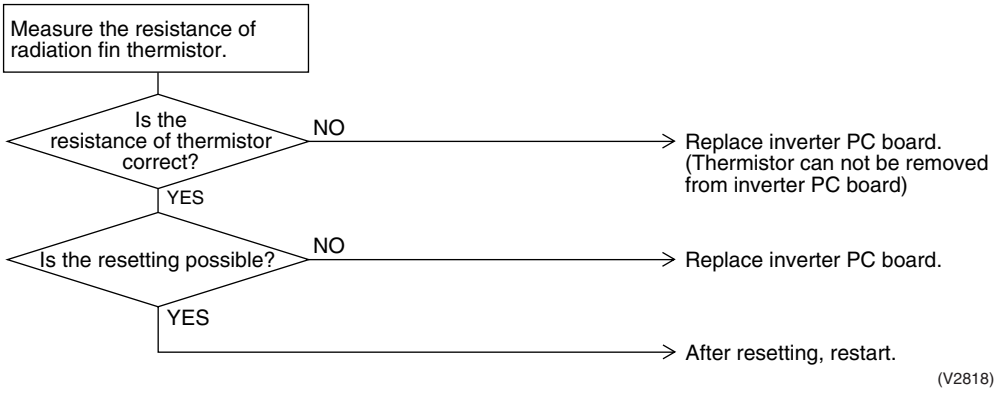
- Malfunction is not decided while the unit operation is continued.
  "P4" will be displayed by pressing the inspection button.

Supposed Causes

- Defect of radiator fin temperature sensor
- Defect of inverter PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



∗2: Refer to thermistor resistance / temperature characteristics table on P278.

2.36 "PJ" Outdoor Unit: Faulty Field Setting after Replacing Main PC Board or Faulty Combination of PC Board

Remote Controller Display

PJ

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

The faulty (or no) field setting after replacing main PC board or faulty PC board combination is detected through communications with the inverter.

Malfunction Decision Conditions

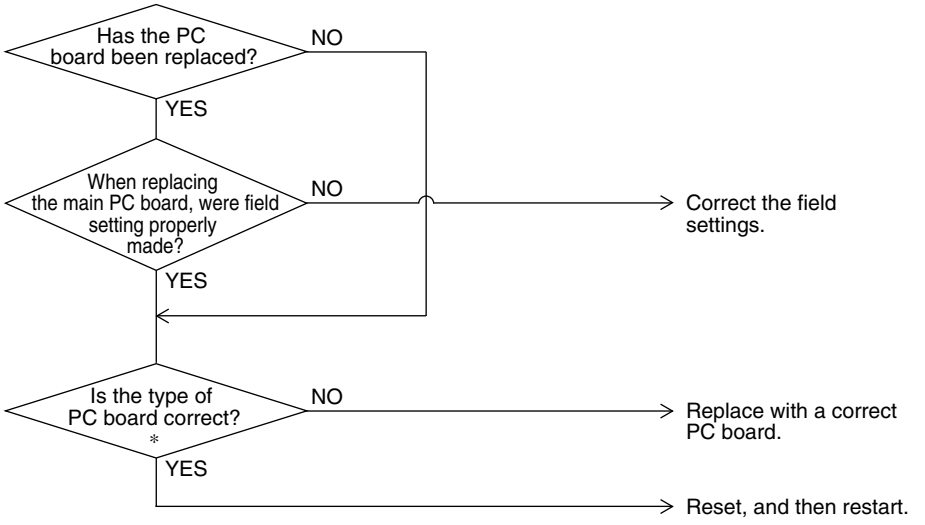
Whether or not the field setting or the type of the PC board is correct through the communication date is judged.

Supposed Causes

- Faulty (or no) field setting after replacing main PC board
- Mismatching of type of PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



*Note) Type of PC board mismatching includes;
Main PC board
Inverter PC board (for compressor)
Fan driver PC board

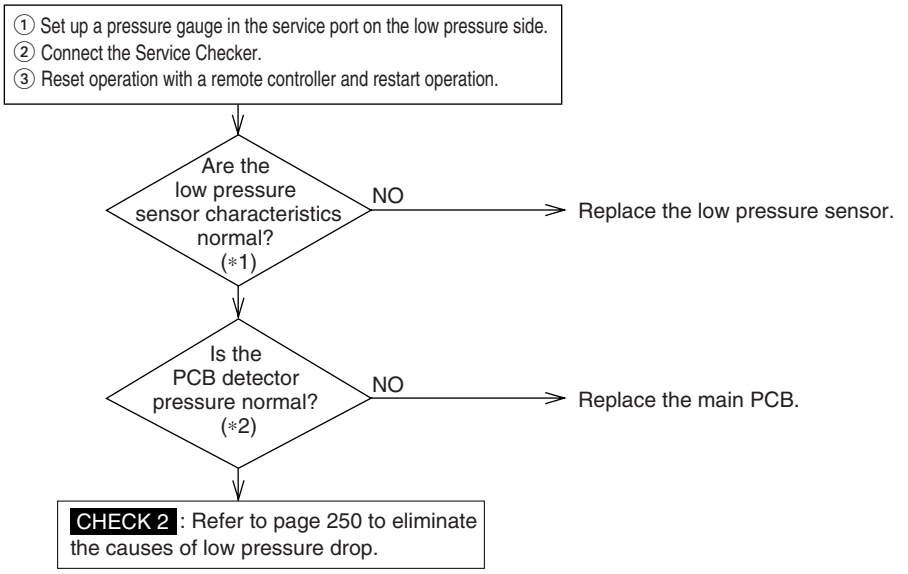
2.37 "U0" Low Pressure Drop Due to Refrigerant Shortage or Electronic Expansion Valve Failure

Remote Controller Display	U0
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Detect insufficient gas using low pressure or difference in temperature between the suction pipe and the heat exchanger.
Malfunction Decision Conditions	In cooling ■ Low pressure of 36.2psi or less continues for 30 minutes In heating ■ Suction gas superheated degree of 36°F or more continues for 60 minutes. ∗ Abnormality is not confirmed and operation is continued.
Supposed Causes	■ Insufficient gas or clogged refrigerant (wrong piping) ■ Faulty thermistor (R2T, R4T) ■ Faulty low pressure sensor ■ Faulty main PCB (A1P)

Troubleshooting

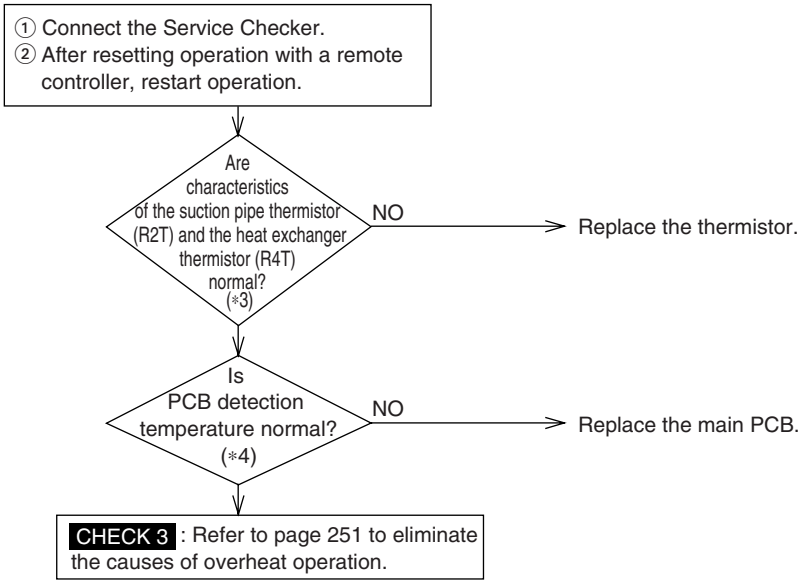
Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

In cooling



∗1 : Compare pressure sensor measurements with pressure gauge readings.
(For measurements by a pressure sensor, measure voltage between connectors (2) and (3) and convert it to pressure in accordance with page 280.)
∗2 : Compare low pressure measured by the Service Checker with pressure sensor measurements (refer to ∗1).

In heating



∗3 : Compare the thermistor resistance with surface thermostat measurements.
∗4 : Compare the suction pipe temperature checked by the Service Checker with measurements obtained in ∗3 above.

2.38 "U1" Reverse Phase, Open Phase

Remote Controller Display

U1

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

The phase of each phase are detected by reverse phase detection circuit and right phase or reverse phase are judged.

Malfunction Decision Conditions

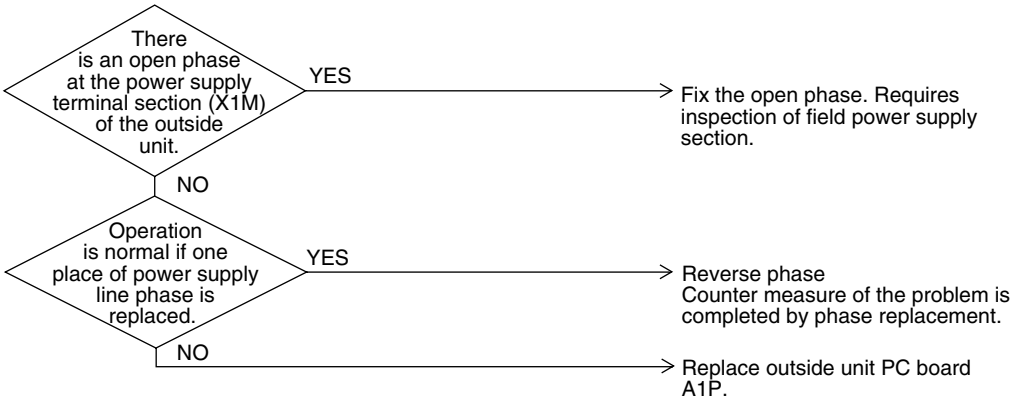
When a significant phase difference is made between phases.

Supposed Causes

- Power supply reverse phase
- Power supply open phase
- Defect of outside PC board A1P

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.39 "U2" Power Supply Insufficient or Instantaneous Failure

Remote Controller Display

U2

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Detection of voltage of main circuit capacitor built in the inverter and power supply voltage.

Malfunction Decision Conditions

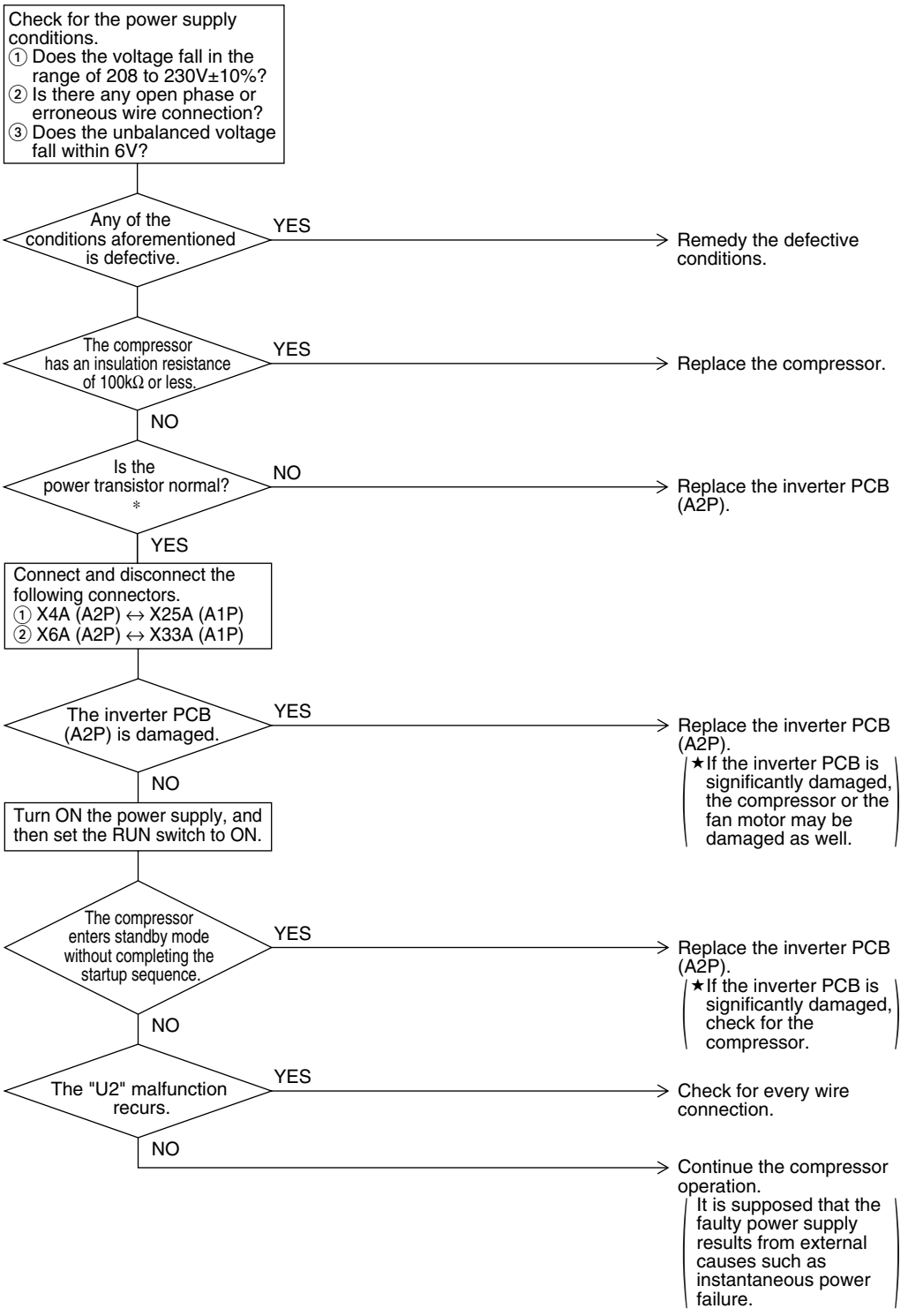
When the capacitor above only has a voltage of 190V or less.

Supposed Causes

- Abnormal power supply voltage
- Instantaneous power failure
- Open phase
- Faulty inverter PCB
- Faulty control PCB
- Faulty compressor
- Faulty wiring in the main circuit
- Faulty connection of signal line

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



* Power transistor check: Refer page 281.

2.40 "U3" Check Operation not Executed

Remote Controller Display

U3

Applicable Models

RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Check operation is executed or not

Malfunction Decision Conditions

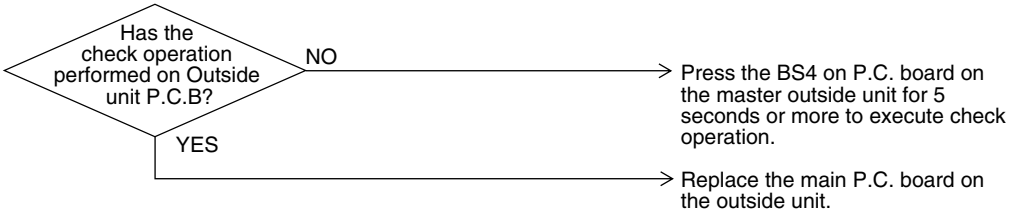
Malfunction is decided when the unit starts operation without check operation.

Supposed Causes

- Check operation is not executed.

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



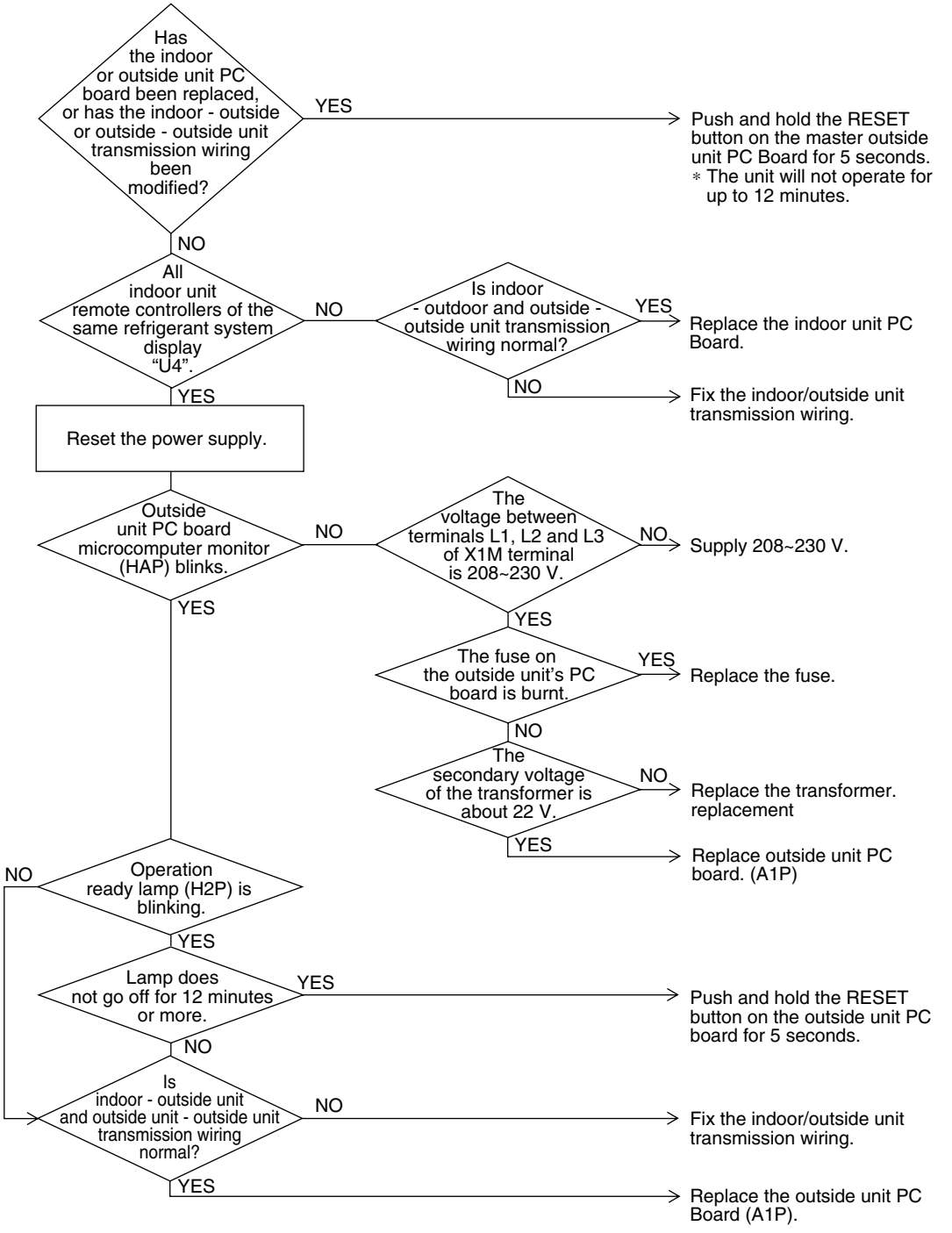
(V3052)

2.41 "U4" Malfunction of Transmission between Indoor Units

Remote Controller Display	U4
Applicable Models	All model of indoor unit RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Microcomputer checks if transmission between indoor and outside units is normal.
Malfunction Decision Conditions	When transmission is not carried out normally for a certain amount of time
Supposed Causes	■ Indoor to outdoor, outside to outside unit transmission wiring F1, F2 disconnection, short circuit or wrong wiring ■ Outside unit power supply is OFF ■ System address doesn't match ■ Defect of indoor unit PC board ■ Defect of outside unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.42 "U5" Malfunction of Transmission between Remote Controller and Indoor Unit

Remote Controller Display

U5

Applicable Models

All models of indoor units

Method of Malfunction Detection

In case of controlling with 2-remote controller, check the system using microcomputer is signal transmission between indoor unit and remote controller (main and sub) is normal.

Malfunction Decision Conditions

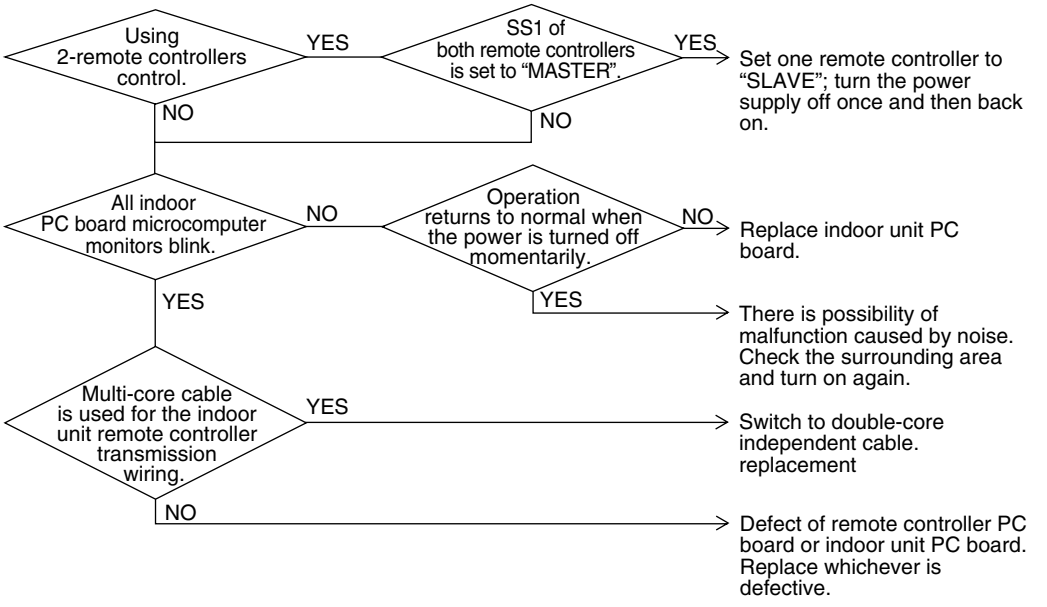
Normal transmission does not continue for specified period.

Supposed Causes

- Malfunction of indoor unit remote controller transmission
- Connection of two main remote controllers (when using 2 remote controllers)
- Defect of indoor unit PC board
- Defect of remote controller PC board
- Malfunction of transmission caused by noise

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



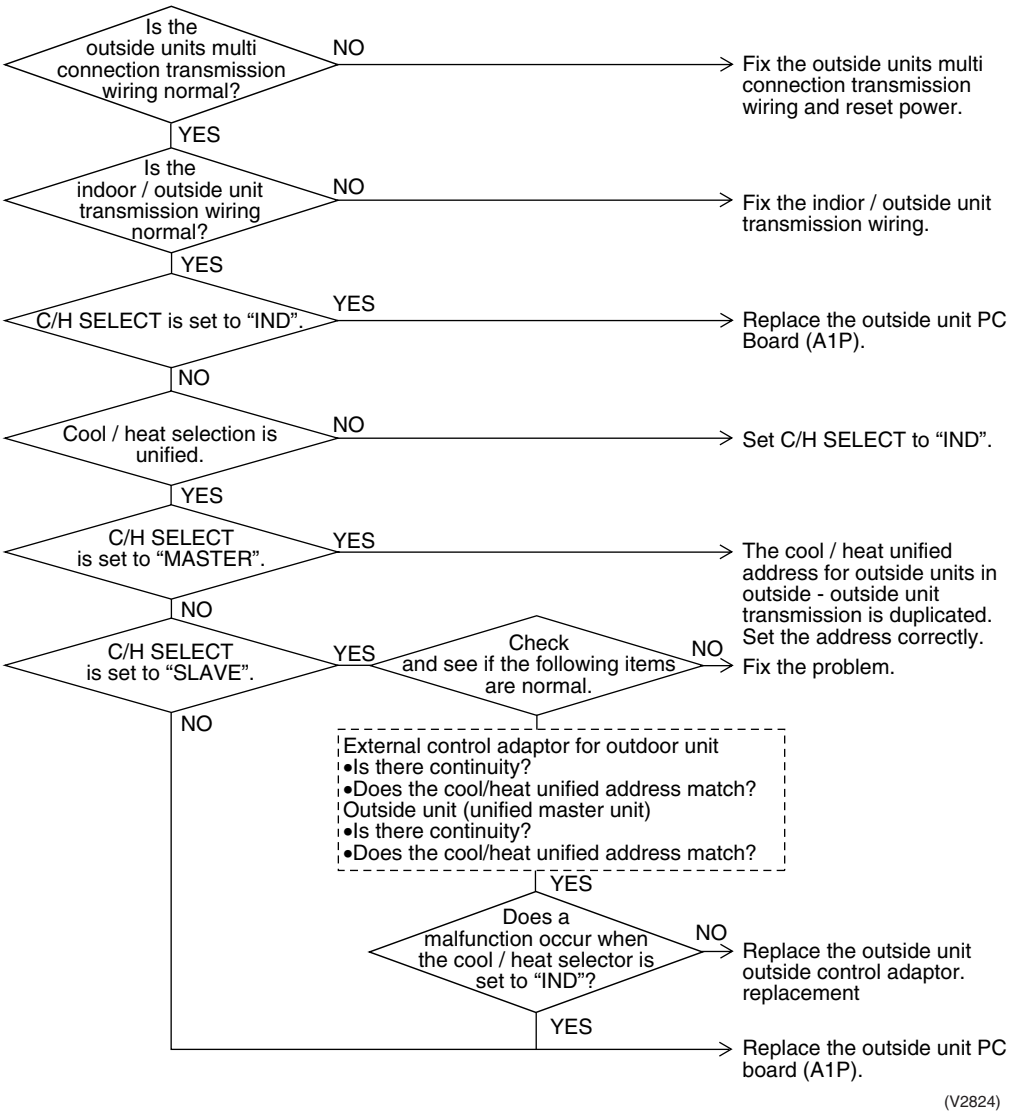
(V2823)

2.43 "U7" Malfunction of Transmission between Outside Units

Remote Controller Display	U7
Applicable Models	RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Microcomputer checks if transmission between indoor unit and remote controller is normal.
Malfunction Decision Conditions	When transmission is not carried out normally for a certain amount of time
Supposed Causes	■ Improper connection of transmission wiring between outside unit and external control adaptor for outdoor unit. ■ Improper cool/heat selection ■ Improper cool/heat unified address (outside unit, external control adaptor for outdoor unit) ■ Defect of outside unit PC board (A1P) ■ Defect of external control adaptor for outdoor unit ■ Improper connection of transmission wiring between outside units of multi outside unit connection.

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.44 "U8" Malfunction of Transmission between Master and Slave Remote Controllers

Remote Controller Display

U8

Applicable Models

All models of indoor units

Method of Malfunction Detection

In case of controlling with 2-remote controller, check the system using microcomputer if signal transmission between indoor unit and remote controller (main and sub) is normal.

Malfunction Decision Conditions

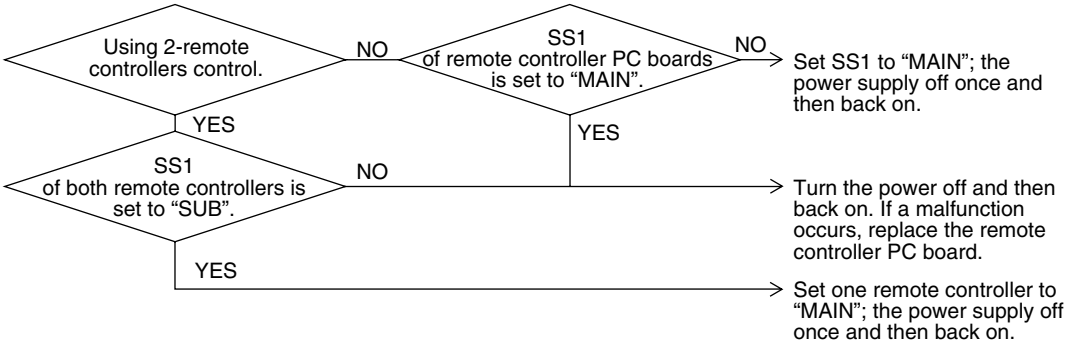
Normal transmission does not continue for specified period.

Supposed Causes

- Malfunction of transmission between main and sub remote controller
- Connection between sub remote controllers
- Defect of remote controller PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



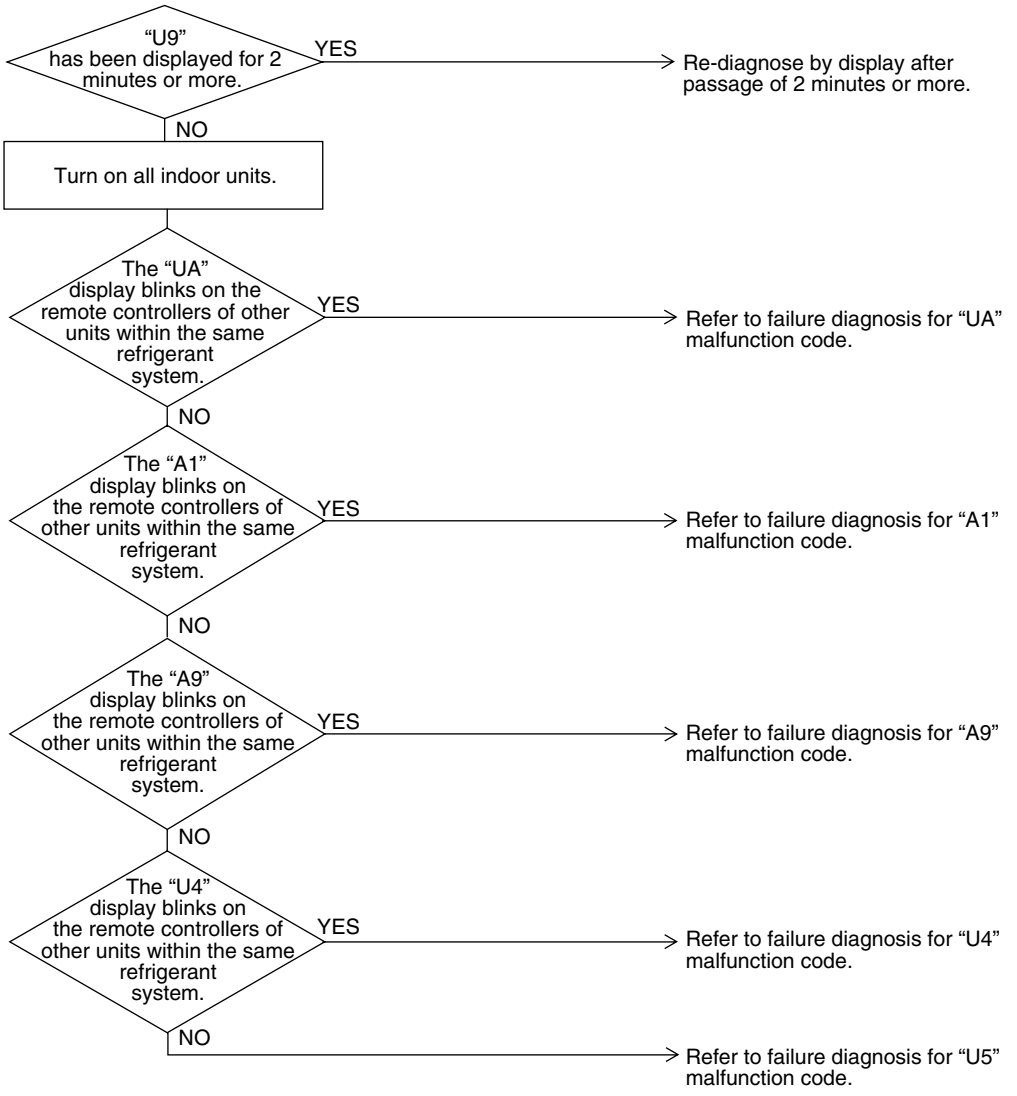
(V2825)

2.45 "U9" Malfunction of Transmission between Indoor and Outside Units in the Same System

Remote Controller Display	U9
Applicable Models	All models of indoor units
Method of Malfunction Detection	Detect the malfunction signal of any other indoor unit within the system concerned.
Malfunction Decision Conditions	When the malfunction decision is made on any other indoor unit within the system concerned.
Supposed Causes	■ Malfunction of transmission within or outside of other system ■ Malfunction of electronic expansion valve in indoor unit of other system ■ Defect of PC board of indoor unit in other system ■ Improper connection of transmission wiring between indoor and outside unit

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2826)

2.46 "UA" Indoor & Outside Units and Remote Controller Combination Failure

Remote Controller Display

UA

Applicable Models

All models of indoor unit
RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

Detect abnormalities in combination of indoor and outside units and the remote controller using the outside unit PCB.

Malfunction Decision Conditions

When any of the followings is detected, failure is instantly confirmed.

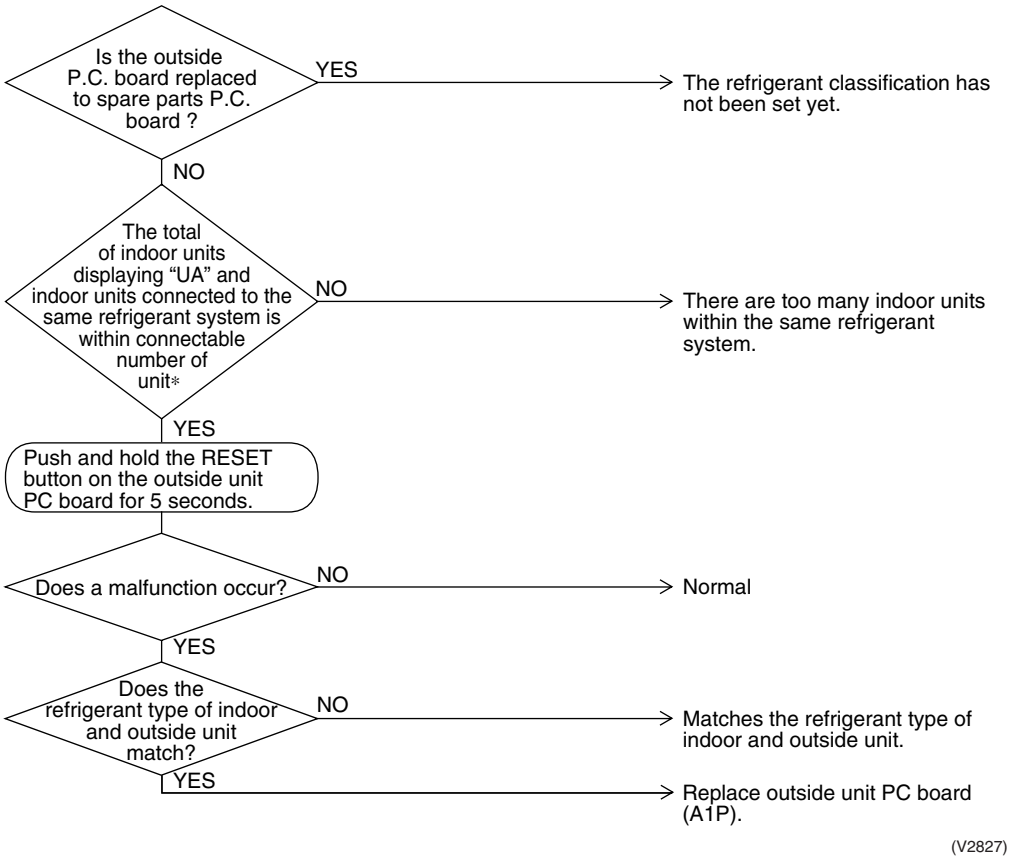
- When there is a problem in the combination of the indoor and outside units
- When there is a problem in the combination of the indoor unit and the remote controller

Supposed Causes

- Excess of connected indoor units
- Defect of outside unit PC board (A1P)
- Mismatching of the refrigerant type of indoor and outside unit.
- Setting of outside P.C. board was not conducted after replacing to spare parts P.C. board.

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2827)

* The number of indoor units that can be connected to a single outside unit system depends on the type of outside unit.

2.47 "UC" Address Duplication of Centralized Controller

Remote Controller Display

UC

Applicable Models

All models of indoor unit
Centralized controller

Method of Malfunction Detection

The principal indoor unit detects the same address as that of its own on any other indoor unit.

Malfunction Decision Conditions

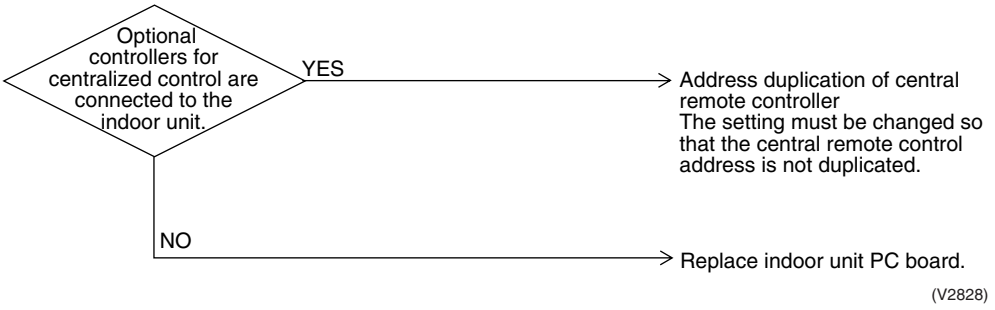
The malfunction decision is made as soon as the abnormality aforementioned is detected.

Supposed Causes

- Address duplication of centralized remote controller
- Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

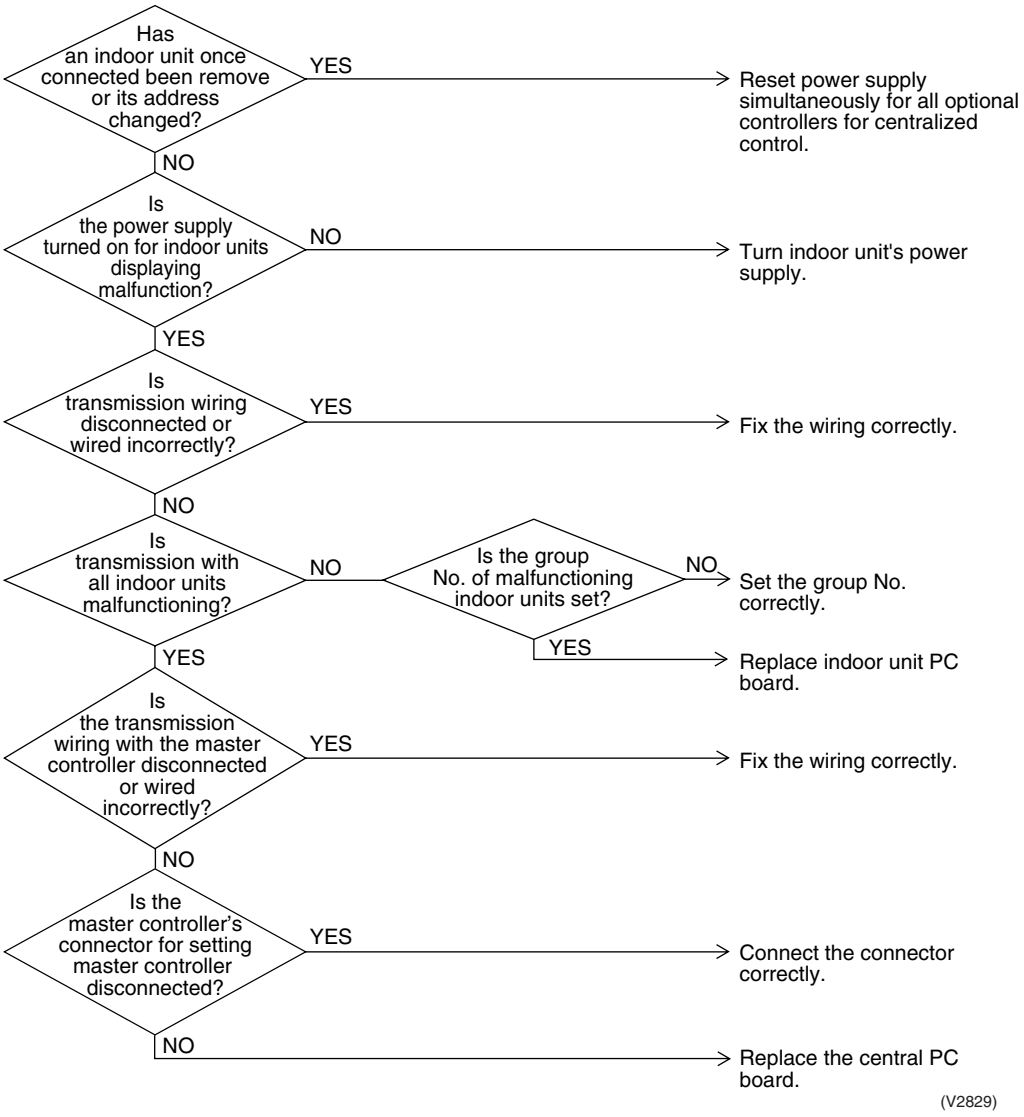


2.48 "UE" Malfunction of Transmission between Centralized Controller and Indoor Unit

Remote Controller Display	UE
Applicable Models	All models of indoor units Centralized controller
Method of Malfunction Detection	Microcomputer checks if transmission between indoor unit and centralized controller is normal.
Malfunction Decision Conditions	When transmission is not carried out normally for a certain amount of time
Supposed Causes	■ Malfunction of transmission between optional controllers for centralized control and indoor unit ■ Connector for setting master controller is disconnected. ■ Failure of PC board for central remote controller ■ Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



2.49 "UF" Refrigerant System not Set, Incompatible Wiring/ Piping

Remote Controller Display

UF

Applicable Models

All models of indoor units
RWEYQ60, 72, 84MTJU

Method of Malfunction Detection

On check operation, the number of indoor units in terms of transmission is not corresponding to that of indoor units that have made changes in temperature.

Malfunction Decision Conditions

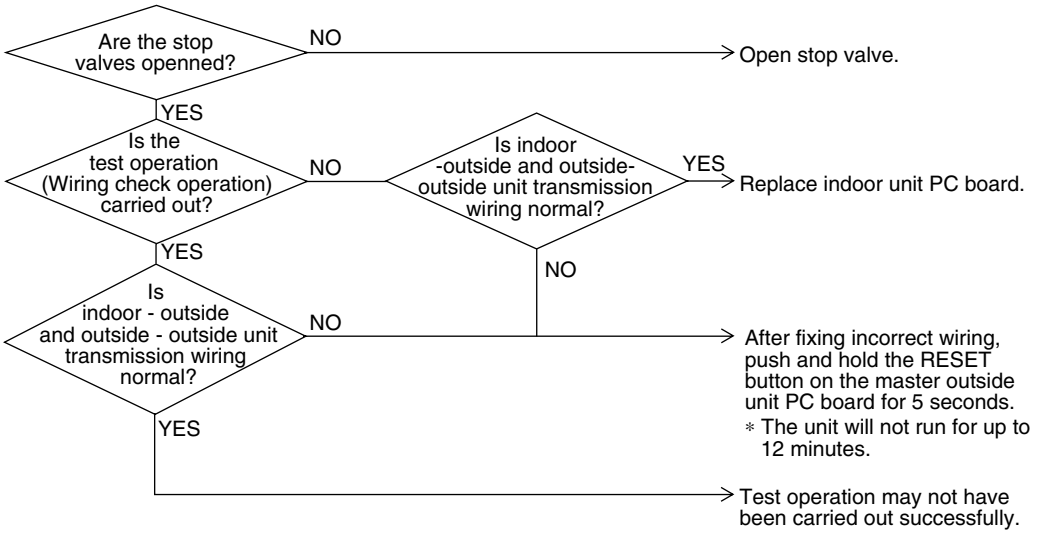
The malfunction is determined as soon as the abnormality aforementioned is detected through checking the system for any erroneous connection of units on the check operation.

Supposed Causes

- Improper connection of transmission wiring between outside unit and external control adaptor for outdoor unit.
- Failure to execute wiring check operation
- Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2830)

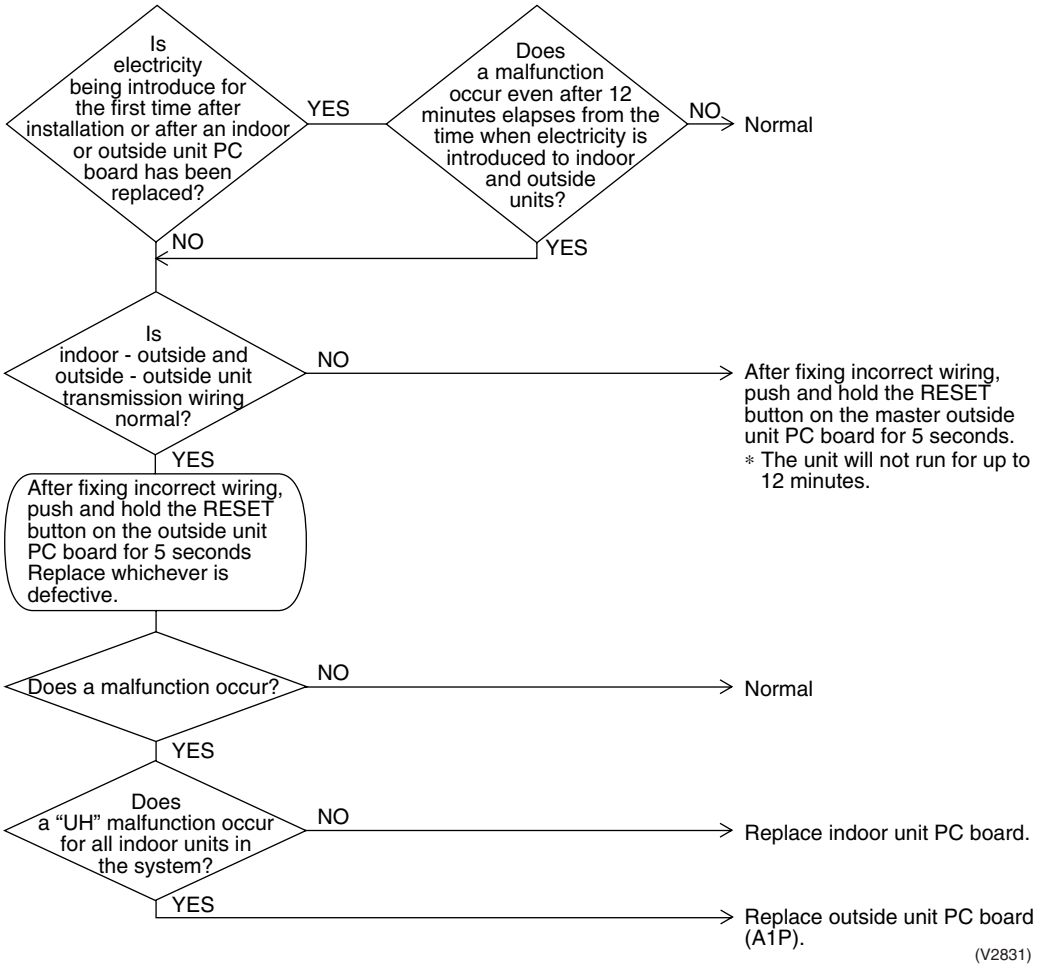
Note: Test operation may not be successful if carried out after the outside unit has been off for more than 12 hours, or if it is not carried out after running all connected indoor units in the fan mode for at least an hour.

2.50 "UH" Malfunction of System, Refrigerant System Address Undefined

Remote Controller Display	UH
Applicable Models	All models of indoor units RWEYQ60, 72, 84MTJU
Method of Malfunction Detection	Detect an indoor unit with no auto address setting.
Malfunction Decision Conditions	The malfunction decision is made as soon as the abnormality aforementioned is detected.
Supposed Causes	■ Improper connection of transmission wiring between outside unit and outside unit outside control adaptor ■ Defect of indoor unit PC board ■ Defect of outside unit PC board (A1P)

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



3. Troubleshooting (OP: Central Remote Controller)

3.1 "M1" PC Board Defect

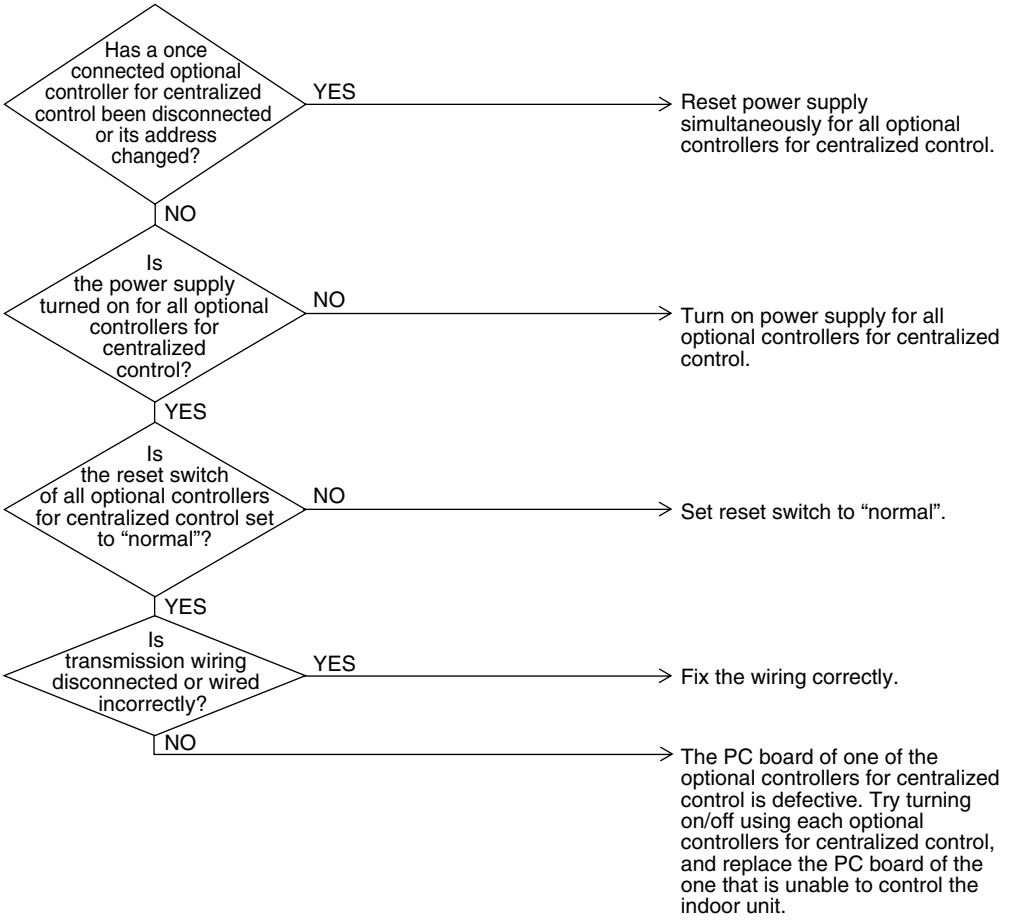
Remote Controller Display	M1
Applicable Models	Central remote controller
Method of Malfunction Detection	Detect an abnormality in the DIII-NET polarity circuit.
Malfunction Decision Conditions	When + polarity and - polarity are detected at the same time.
Supposed Causes	■ Defect of central remote controller PC board
Troubleshooting	Replace the central remote controller.

3.2 "M8" Malfunction of Transmission between Optional Controllers for Centralized Control

Remote Controller Display	M8
Applicable Models	Central remote controller
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data. (The system will be automatically reset.)
Malfunction Decision Conditions	When no master controller is present at the time of the startup of slave controller. When the centralized controller, which was connected once, shows no response.
Supposed Causes	■ Malfunction of transmission between optional controllers for centralized control ■ Defect of PC board of optional controllers for centralized control

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



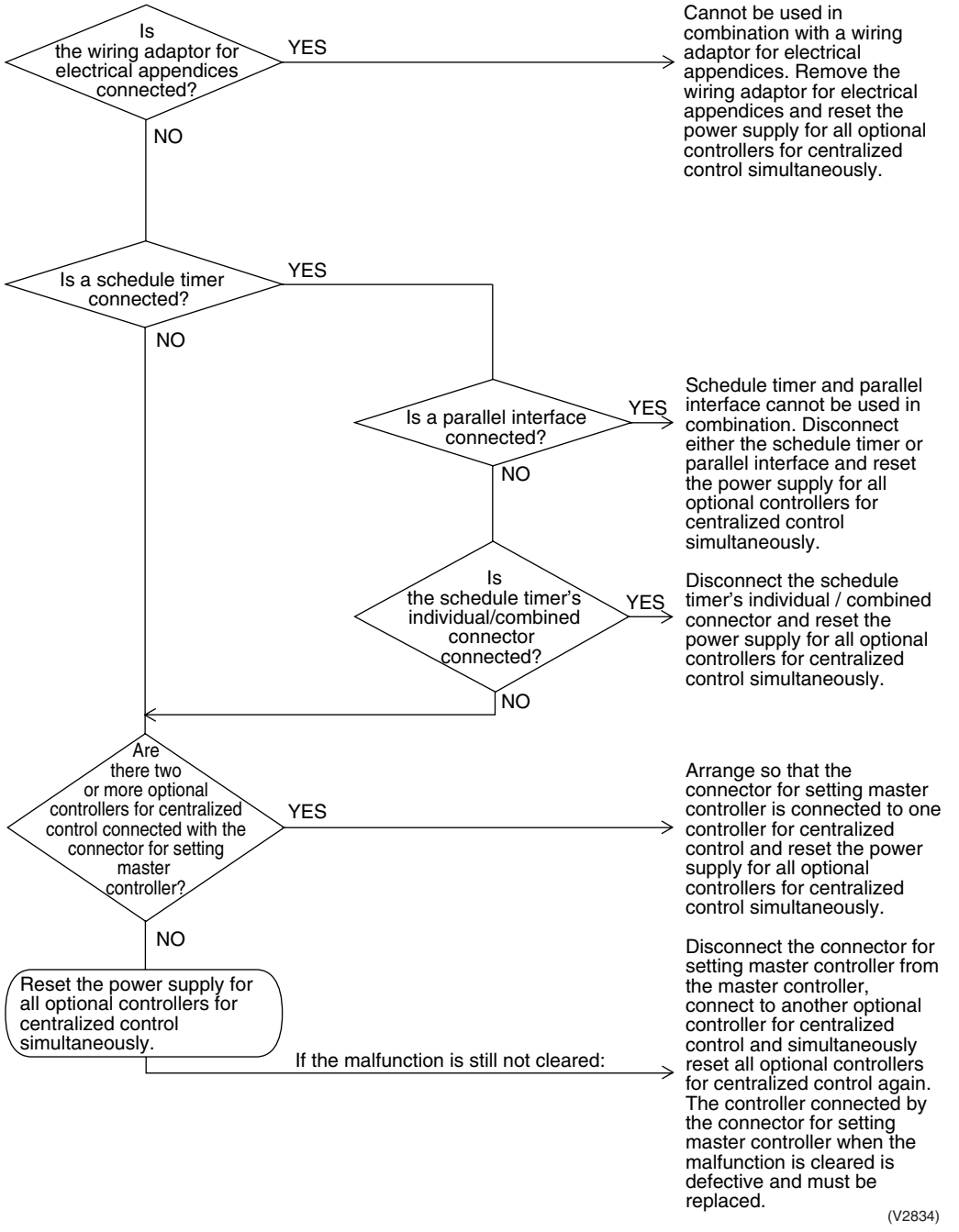
(V2833)

3.3 "MA" Improper Combination of Optional Controllers for Centralized Control

Remote Controller Display	MA
Applicable Models	Central remote controllerr
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	When the schedule timer is set to individual use mode, other central component is present. When multiple master controller are present. When the remote control adapter is present.
Supposed Causes	■ Improper combination of optional controllers for centralized control ■ More than one master controller is connected ■ Defect of PC board of optional controller for centralized control

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



3.4 "MC" Address Duplication, Improper Setting

Remote Controller Display

MC

Applicable Models

Central remote controller

Method of Malfunction Detection

Detect the malfunction according to DIII-NET transmission data.

Malfunction Decision Conditions

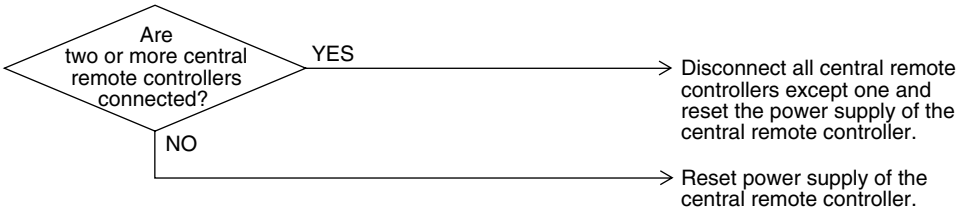
Two units are both set to master controller mode or slave controller mode.

Supposed Causes

- Address duplication of centralized remote controller

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2835)

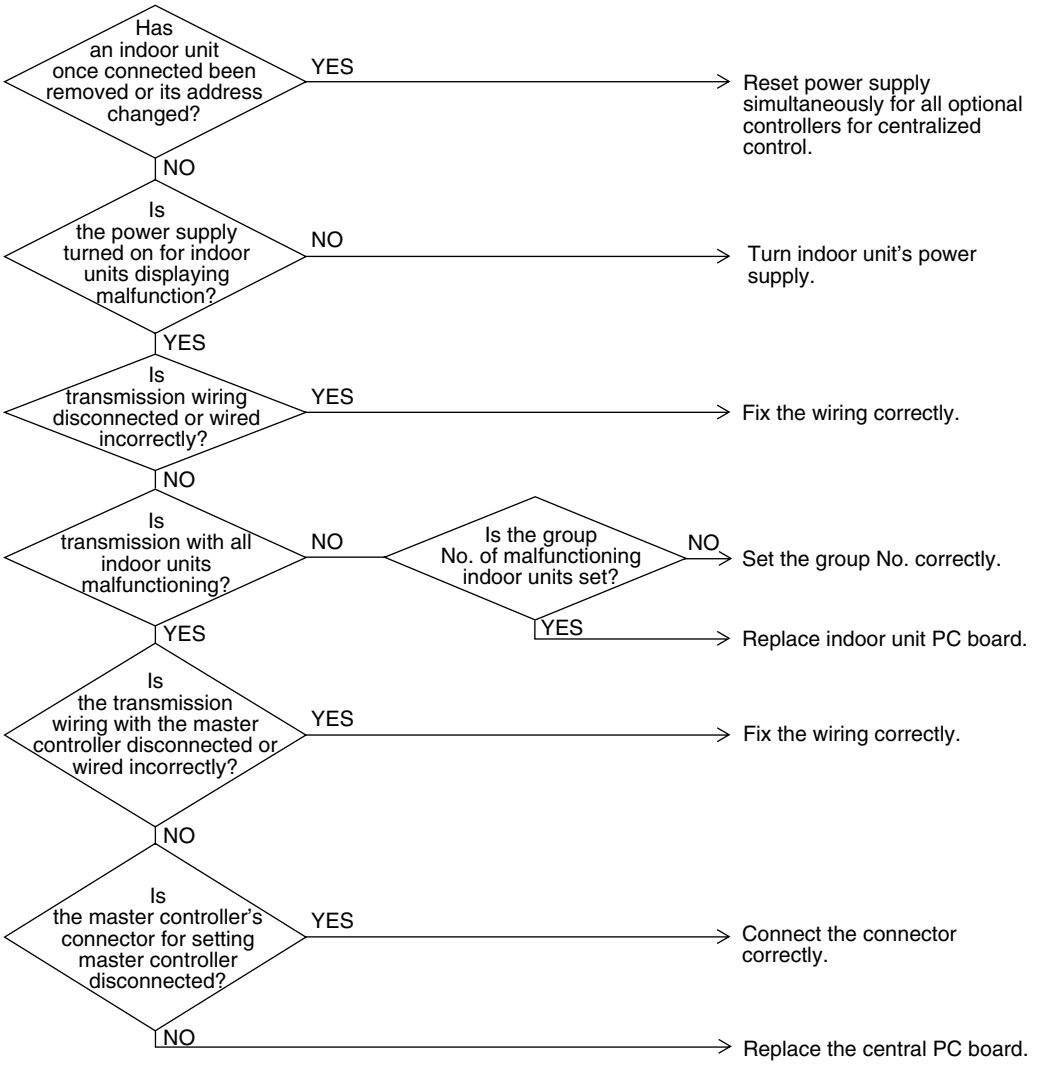
4. Troubleshooting (OP: Schedule Timer)

4.1 "UE" Malfunction of Transmission between Centralized Controller and Indoor Unit

Remote Controller Display	UE
Applicable Models	Schedule timer All models of indoor units
Method of Malfunction Detection	Microcomputer checks if transmission between indoor unit and centralized controller is normal.
Malfunction Decision Conditions	When transmission is not carried out normally for a certain amount of time
Supposed Causes	■ Malfunction of transmission between central remote controller and indoor unit ■ Disconnection of connector for setting master controller (or individual/combined switching connector) ■ Defect of schedule timer PC board ■ Defect of indoor unit PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2836)

4.2 "M1" PC Board Defect

Remote Controller Display

M1

Applicable Models

Schedule timer

Method of Malfunction Detection

Detect an abnormality in the DIII-NET polarity circuit.

Malfunction Decision Conditions

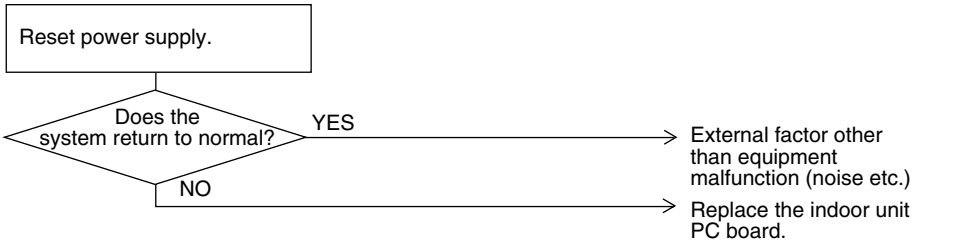
When + polarity and - polarity are detected at the same time.

Supposed Causes

- Defect of schedule timer PC board

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



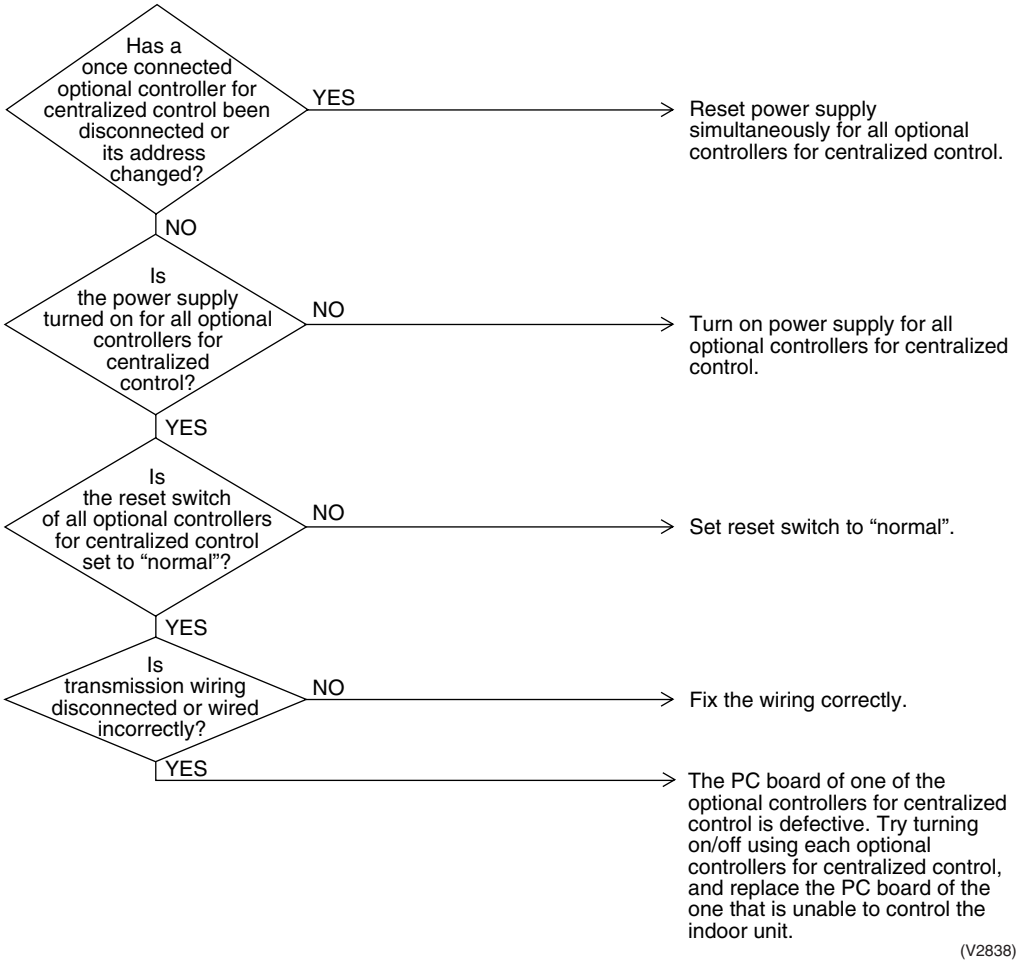
(V2837)

4.3 "M8" Malfunction of Transmission between Optional Controllers for Centralized Control

Remote Controller Display	M8
Applicable Models	Schedule timer
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data. (The system will be automatically reset.)
Malfunction Decision Conditions	When no master controller is present at the time of the startup of slave controller. When the optional controllers for centralized control which was connected once, shows no response.
Supposed Causes	■ Malfunction of transmission between optional controllers for centralized control ■ Defect of PC board of optional controllers for centralized control

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.

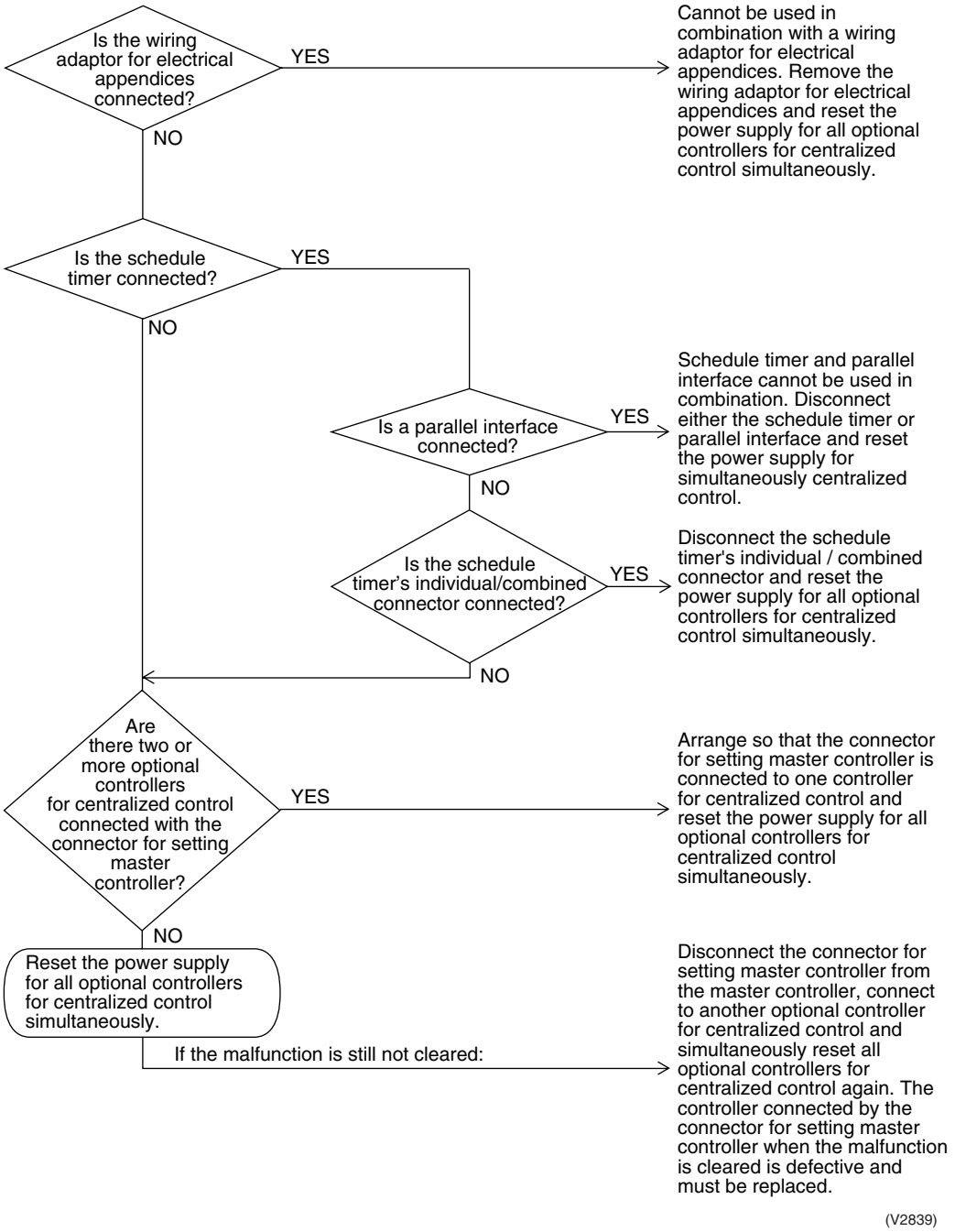


4.4 "MA" Improper Combination of Optional Controllers for Centralized Control

Remote Controller Display	MA
Applicable Models	Schedule timer
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	When the schedule timer is set to individual use mode, other central component is present. When multiple master controller are present.
Supposed Causes	■ Improper combination of optional controllers for centralized control ■ More than one master controller is connected. ■ Defect of PC board of optional controller for centralized control

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2839)

4.5 "MC" Address Duplication, Improper Setting

Remote Controller Display

MC

Applicable Models

All models of indoor units,
schedule timer

Method of Malfunction Detection

Detect the malfunction according to DIII-NET transmission data.

Malfunction Decision Conditions

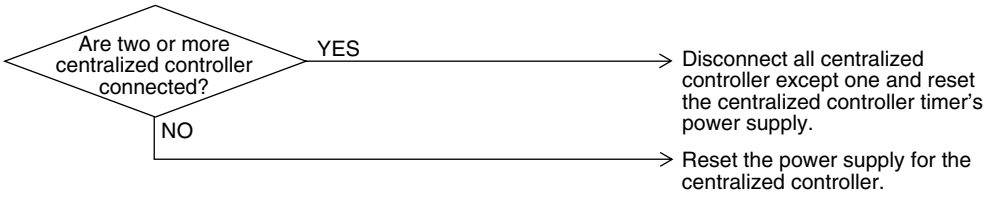
When two or more schedule timers are connected.

Supposed Causes

- Address duplication of optional controller for centralized control

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



(V2840)

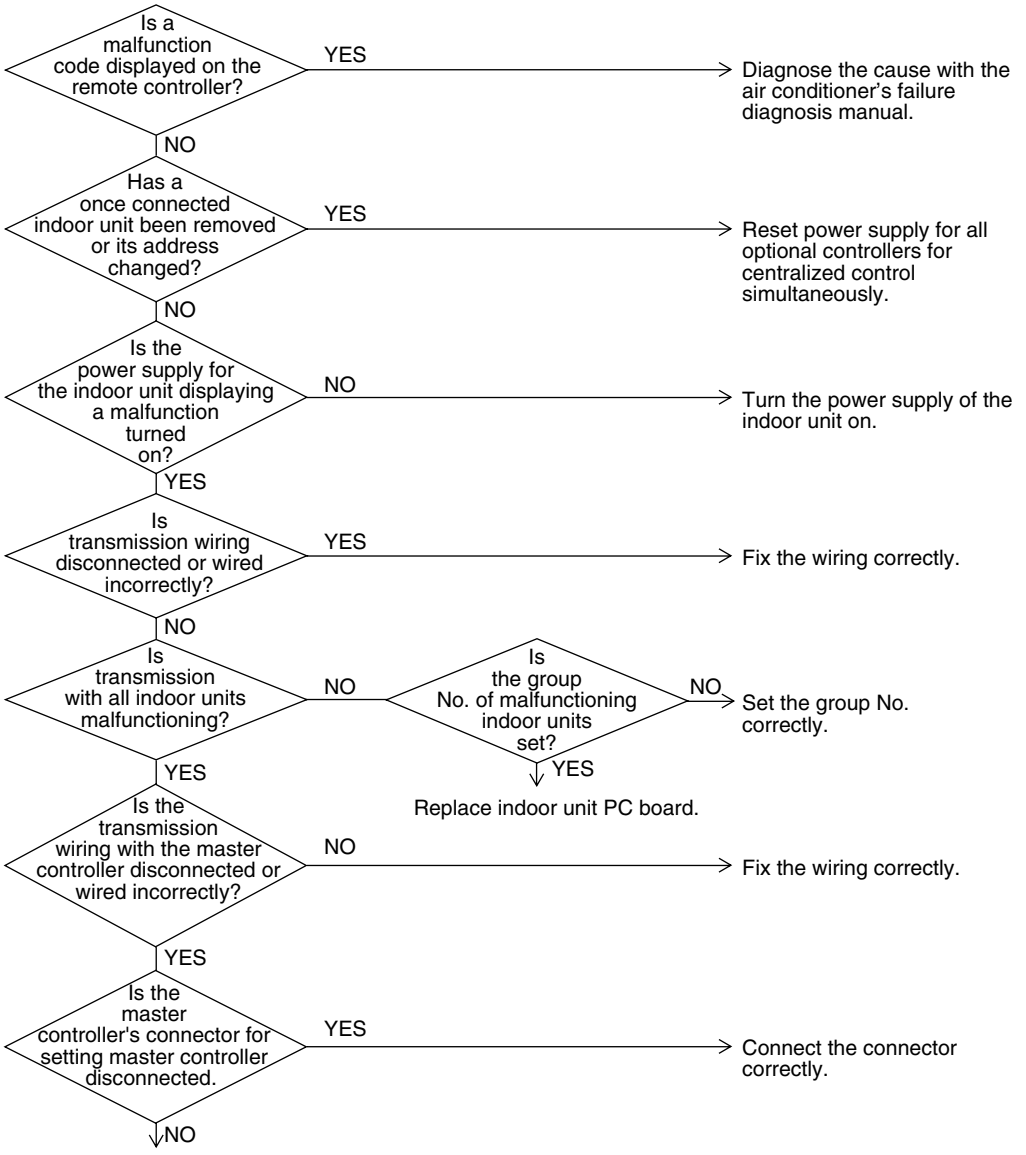
5. Troubleshooting (OP: Unified ON/OFF Controller)

5.1 Operation Lamp Blinks

Remote Controller Display	Operation lamp blinks
Applicable Models	All models of indoor units Unified ON/OFF controller
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	
Supposed Causes	■ Malfunction of transmission between optional controller and indoor unit ■ Connector for setting master controller is disconnected ■ Defect of unified ON/OFF controller ■ Defect of indoor unit PC board ■ Malfunction of air conditioner

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



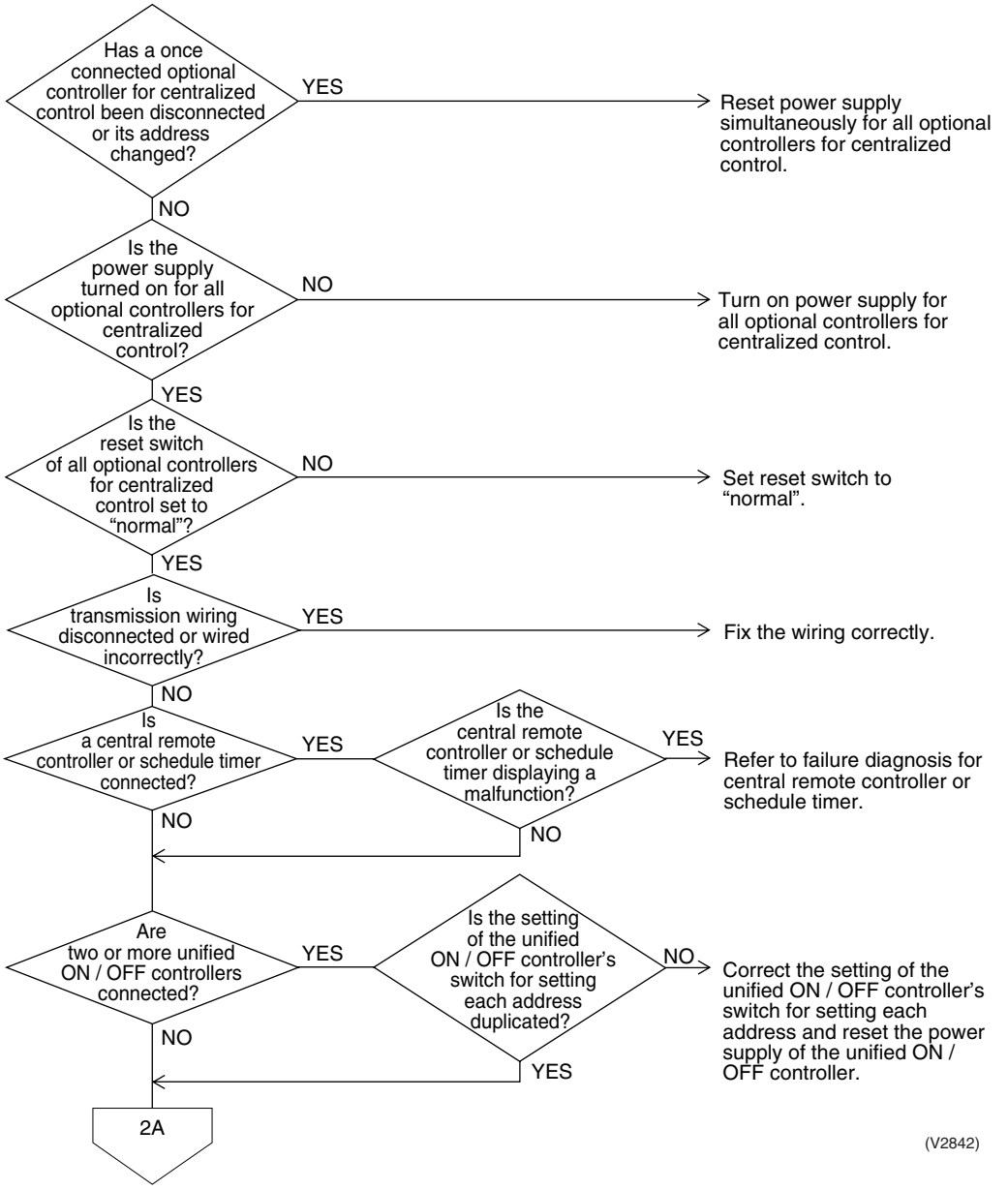
(V2841)

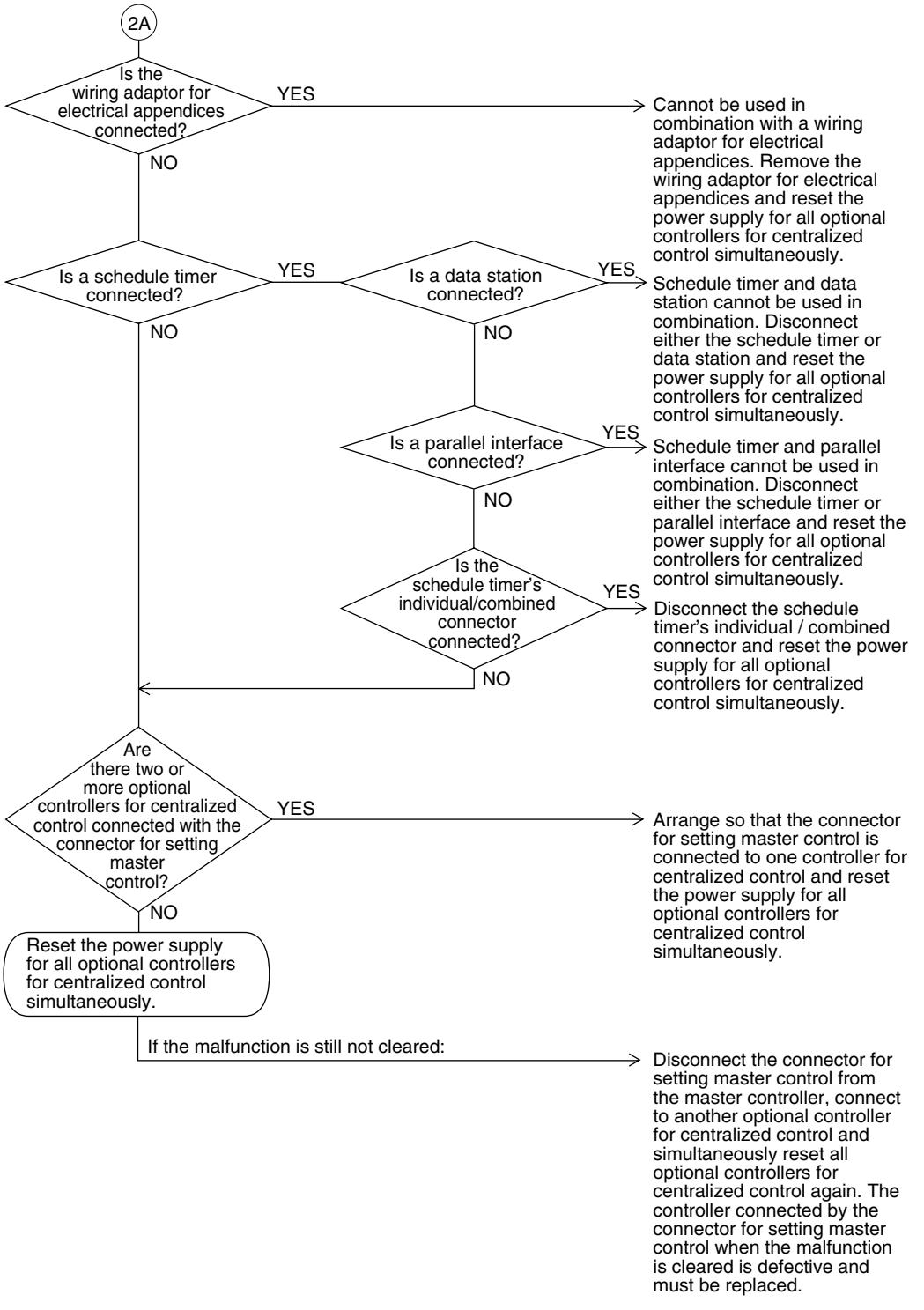
5.2 Display “Under Host Computer Integrate Control” Blinks (Repeats Single Blink)

Remote Controller Display	“under host computer integrated control” (Repeats single blink)
Applicable Models	Unified ON/OFF controller Central remote controller, Schedule timer
Method of Malfunction Detection	Detect the malfunction according to DIII-NET transmission data.
Malfunction Decision Conditions	When the centralized controller, which was connected once, shows no response. The control ranges are overlapped. When multiple master central controller are present. When the schedule timer is set to individual use mode, other central controller is present. When the wiring adaptor for electrical appendices is present.
Supposed Causes	■ Address duplication of central remote controller ■ Improper combination of optional controllers for centralized control ■ Connection of more than one master controller ■ Malfunction of transmission between optional controllers for centralized control ■ Defect of PC board of optional controllers for centralized control

Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.




2A
Is the wiring adaptor for electrical appendices connected?
YES
Cannot be used in combination with a wiring adaptor for electrical appendices. Remove the wiring adaptor for electrical appendices and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Is a schedule timer connected?
YES
Is a data station connected?
YES
Schedule timer and data station cannot be used in combination. Disconnect either the schedule timer or data station and reset the power supply for all optional controllers for centralized control simultaneously.
NO
NO
Is a parallel interface connected?
YES
Schedule timer and parallel interface cannot be used in combination. Disconnect either the schedule timer or parallel interface and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Is the schedule timer's individual/combined connector connected?
YES
Disconnect the schedule timer's individual / combined connector and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Are there two or more optional controllers for centralized control connected with the connector for setting master control?
YES
Arrange so that the connector for setting master control is connected to one controller for centralized control and reset the power supply for all optional controllers for centralized control simultaneously.
NO
Reset the power supply for all optional controllers for centralized control simultaneously.
If the malfunction is still not cleared:
Disconnect the connector for setting master control from the master controller, connect to another optional controller for centralized control and simultaneously reset all optional controllers for centralized control again. The controller connected by the connector for setting master control when the malfunction is cleared is defective and must be replaced.
(V2843)

5.3 Display “Under Host Computer Integrate Control” Blinks (Repeats Double Blink)

Remote Controller Display

“under host computer integrated control” (Repeats double blink)

Applicable Models

Unified ON/OFF controller

Method of Malfunction Detection

Detect the malfunction according to DIII-NET transmission data.

Malfunction Decision Conditions

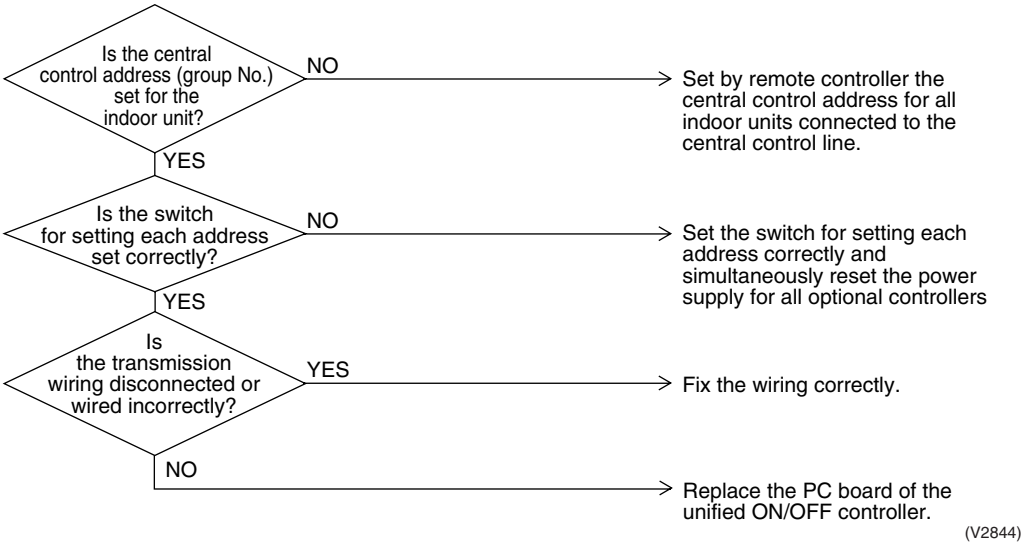
When no central control addresses are set to indoor units.
When no indoor units are connected within the control range.

Supposed Causes

- Central control address (group No.) is not set for indoor unit.
- Improper address setting
- Improper wiring of transmission wiring

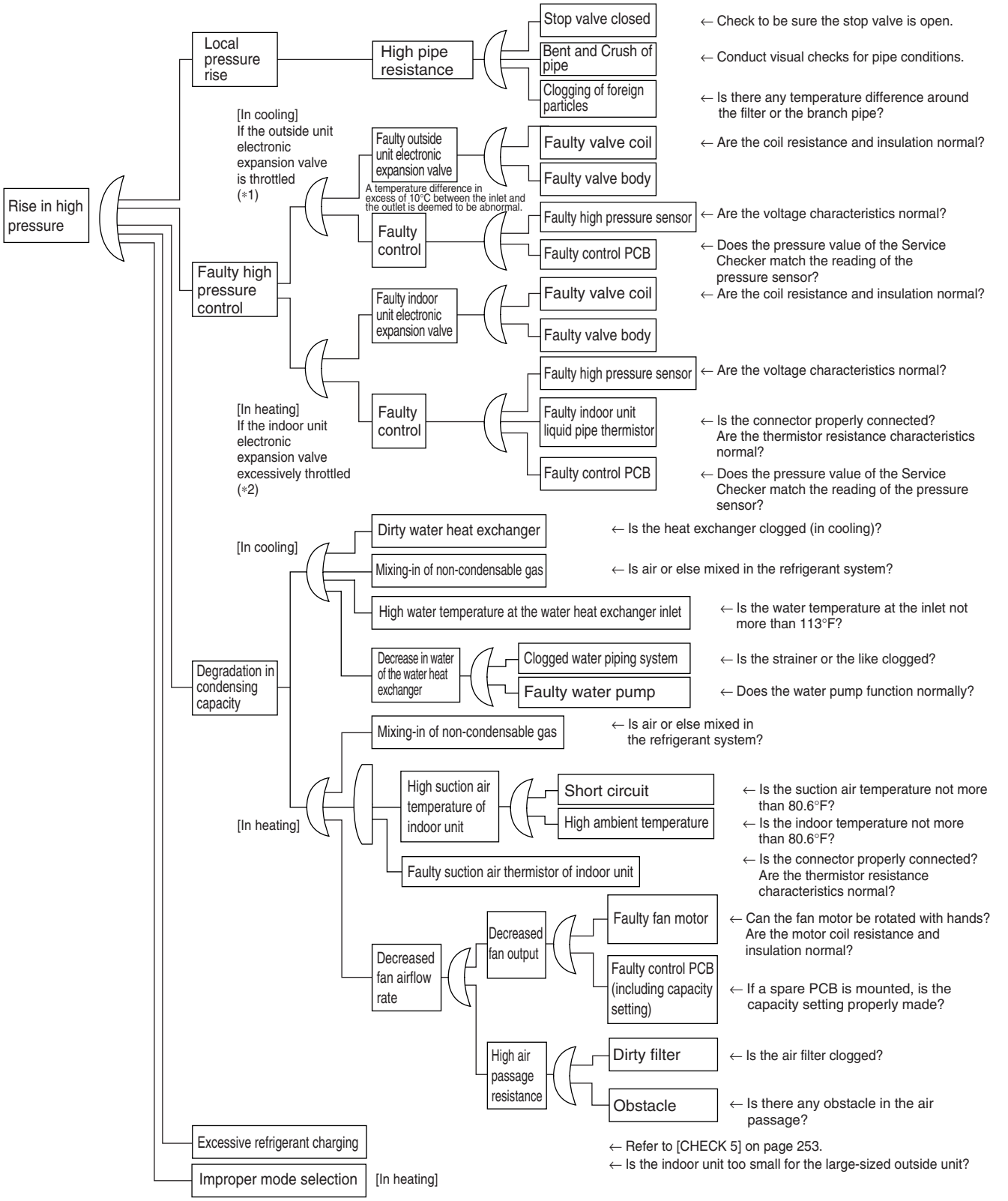
Troubleshooting

Caution Be sure to turn off power switch before connect or disconnect connector, or parts damage may be occurred.



[CHECK 1] Check for causes of rise in high pressure

Referring to the Fault Tree Analysis (FTA) shown below, identify the faulty points.

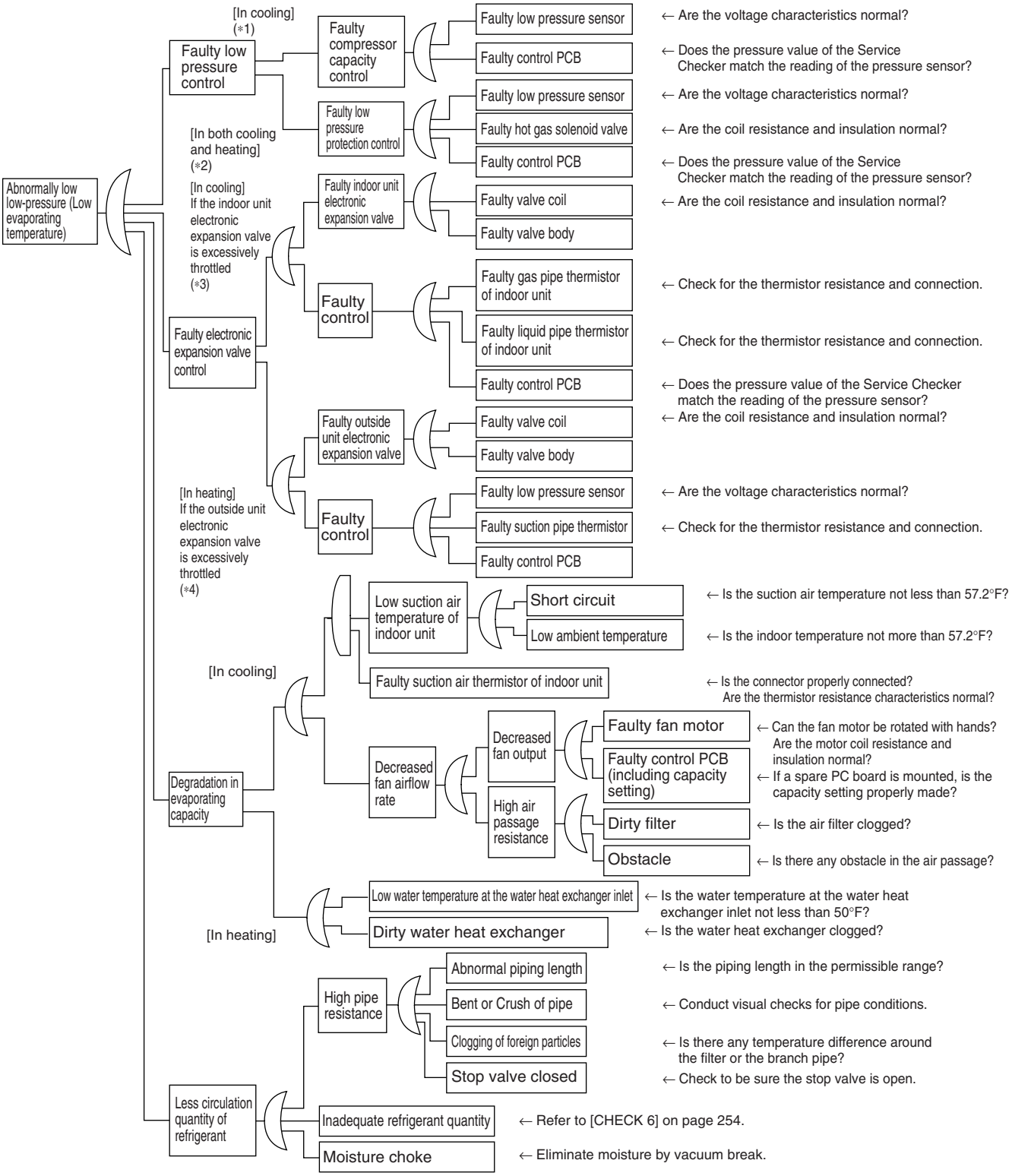


*1 : In cooling, the outside unit electronic expansion valve (Y1E) is fully open in normal condition.

*2 : In heating, the indoor unit electronic expansion valve is used for “subcooled degree control”.
(Refer to “Electronic Expansion Valve Control” on page 89)

[CHECK 2] Check for causes of drop in low pressure

Referring to the Fault Tree Analysis (FTA) shown below, identify the faulty points.



∗1 : For details of the compressor capacity control while in cooling, refer to “Compressor Control” on page 65.

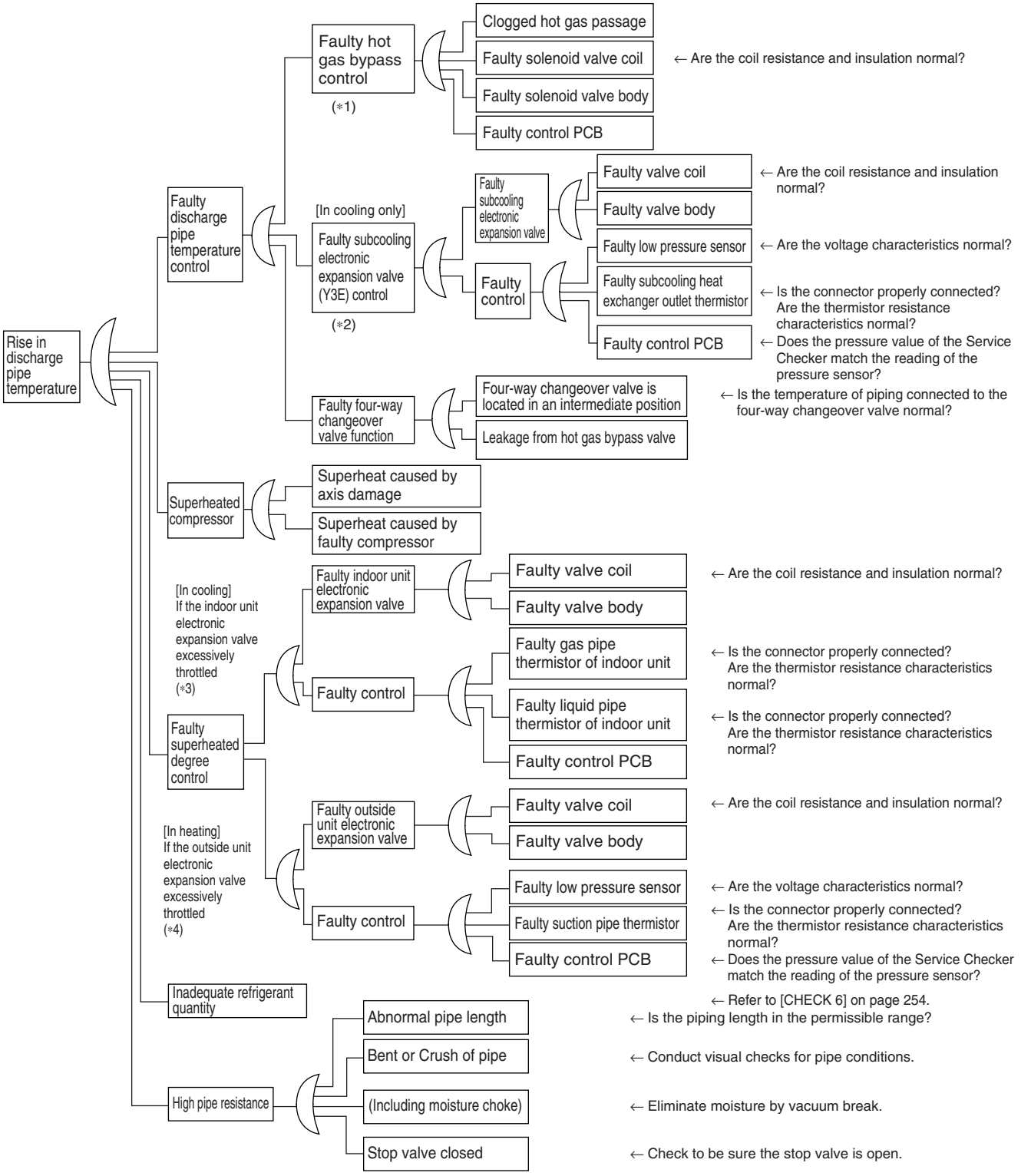
∗2 : The “low pressure protection control” includes low pressure drop control and hot gas bypass control. For details, refer to page 71.

∗3 : In cooling, the indoor unit electronic expansion valve is used for “superheated degree control”. (For details, refer to page 89.)

∗4 : In heating, the outdoor unit electronic expansion valve (Y1E) is used for “superheated degree control of outside unit heat exchanger”. (For details, refer to page 67.)

[CHECK 3] Check for causes of overheat operation

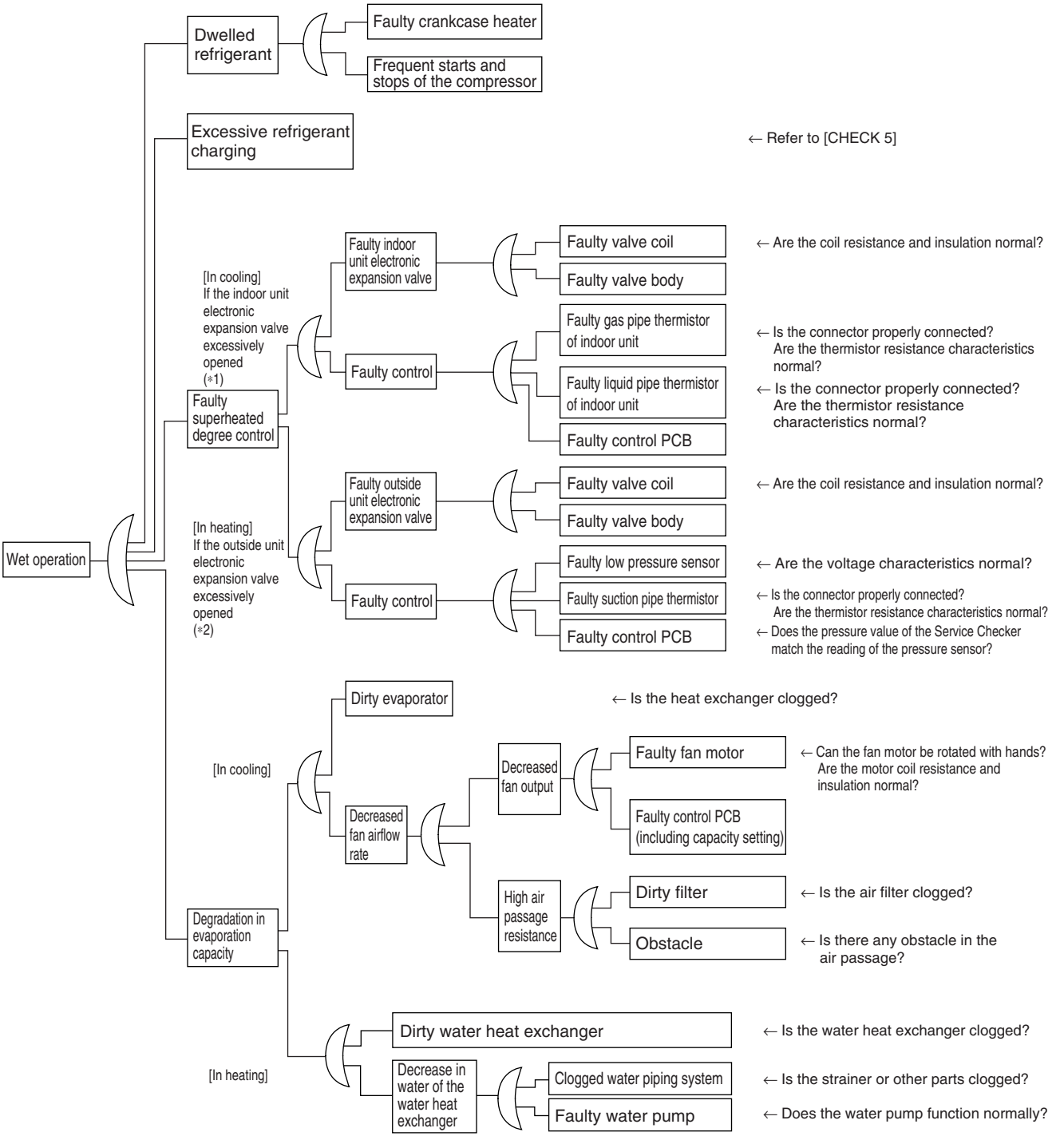
Referring to the Fault Tree Analysis (FTA) shown below, identify the faulty points.



∗1 : For hot gas bypass control, refer to “Low Pressure Protection Control” on page 71.
∗2 : For subcooling electronic expansion valve, refer to page 67.
∗3 : In cooling, the indoor unit electronic expansion valve is used for “superheated degree control”. (Refer to page 89.)
∗4 : In heating, the outside unit electronic expansion valve (Y1E) is used for “superheated degree control.” (Refer to page 67.)
∗5 : Reference values for superheated degree to be used in the judgment of overheat operation
① Suction gas superheated degree: 50°F or more ② Discharge gas superheated degree: 113°F or more, excluding when it is immediately after startup, under drop control or other specific conditions.
(The values above must be used only for reference purposes. Even it is operated within the range above,operation may be normal in other conditions.)

[CHECK 4] Check for causes of wet operation

Referring to the Fault Tree Analysis (FTA) shown below, identify the faulty points.



∗1 : In cooling, the indoor unit electronic expansion valve is used for “superheated degree control”. (Refer to page 89.)

∗2 : In heating, the outside unit electronic expansion valve (Y1E) is used for “superheated degree control”. (Refer to page 67.)

∗3 : Reference values for superheated degree to be used in the judgment of wet operation

① Suction gas superheated degree: 37.4°F or less ② Discharge gas superheated degree: 59°F or less, excluding when it is immediately after startup, under drop control or other specific conditions.

(The values above must be used only for reference purposes. Even it is operated within the range above, operation may be normal in other conditions.)

[CHECK 5] Check for excessive refrigerant charging

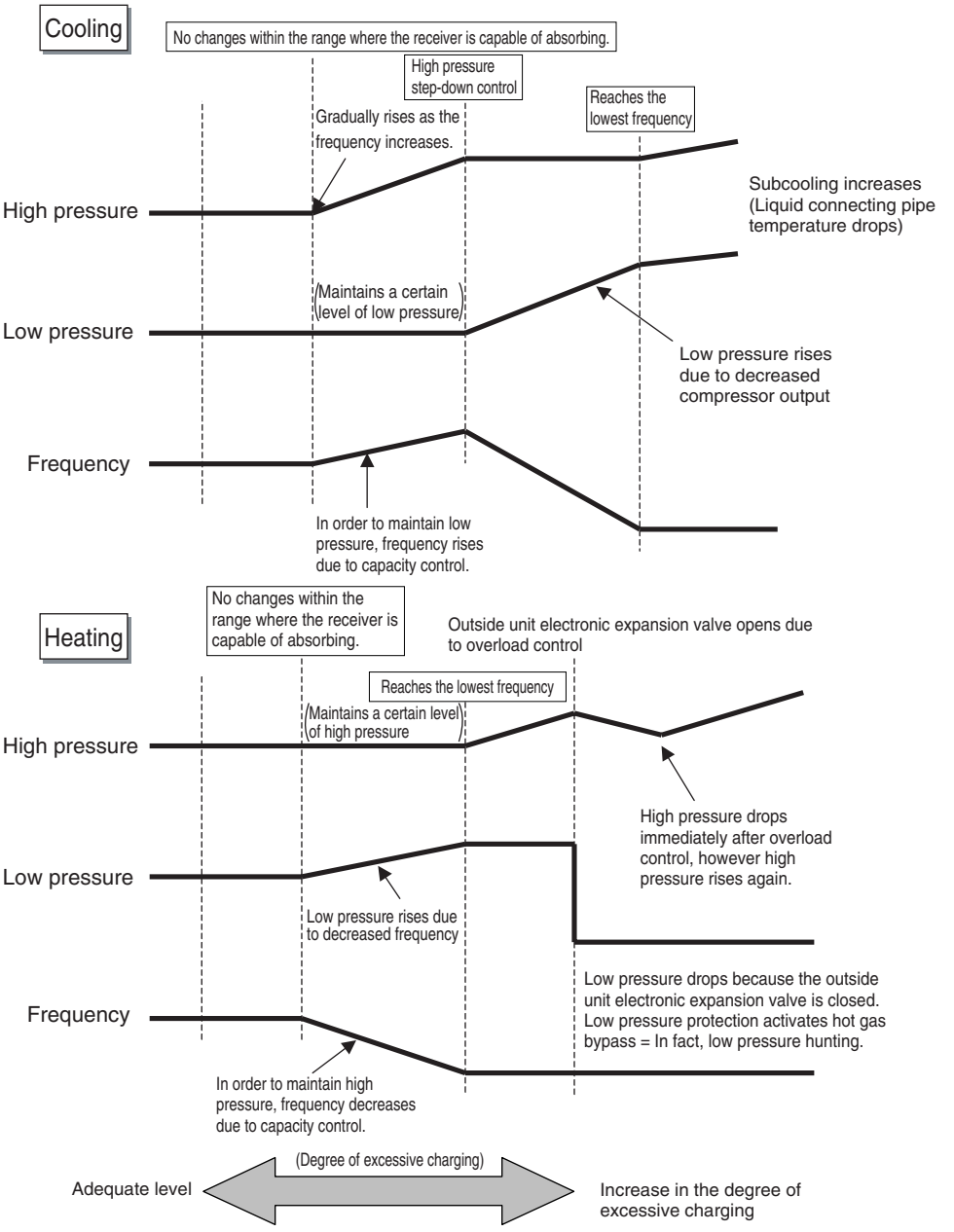
In case of the VRV, judgment must be made based on operation conditions in relation to pressure control and electronic expansion valve control. Refer to the following criteria to make such decisions.

Diagnosis of excessive refrigerant charging

(1) Since high pressure rises, overload control is carried out and therefore capacity tends to be insufficient.

(2) Since superheated degree of suction gas decreases (or it starts wet operation), the temperature of the compressor discharge pipe drops too much for pressure applied.

(3) Since the subcooling degree of condensate liquid increases, the temperature of air blown through subcooled part decreases in heating.



[CHECK 6] Check for inadequate refrigerant quantity

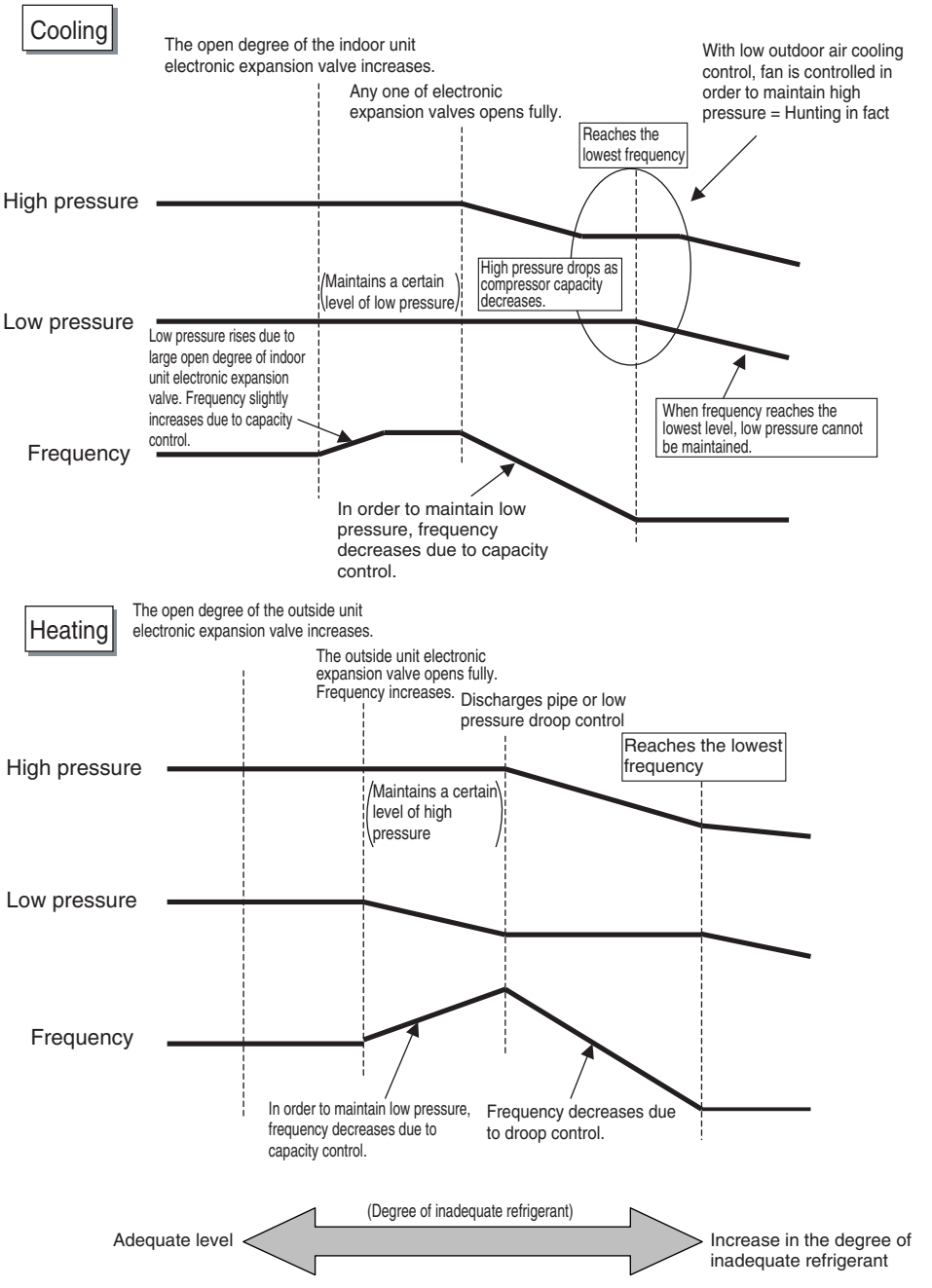
In case of the VRV, judgment must be made based on operation conditions in relation to pressure control and electronic expansion valve control. Refer to the following criteria to make such decisions.

Diagnosis of inadequate refrigerant

(1) The superheated degree of suction gas increases and temperature of compressor discharge gas rises.

(2) The superheated degree of suction gas increases and the electronic expansion valve slightly opens.

(3) With low pressure, cooling capacity (heating capacity) is unavailable.



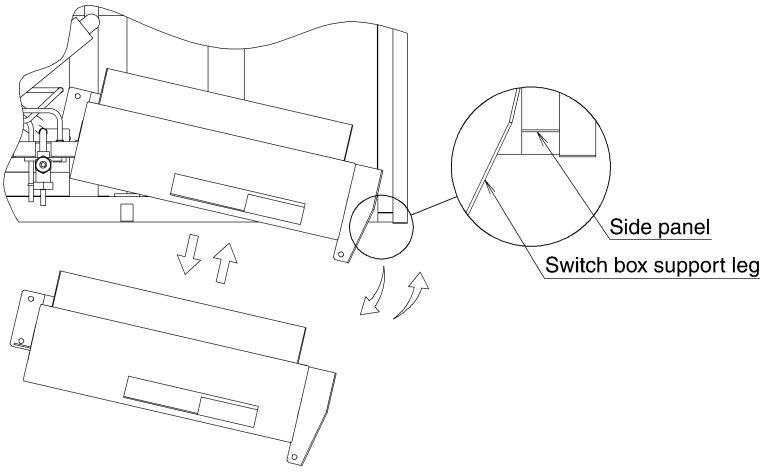
Part 7
Procedure for Mounting / Dismounting of Switch Box

1. Procedure for Mounting / Dismounting of Switch Box 256
1.1 Procedure for Dismounting 256
1.2 Procedure for Mounting 256

1. Procedure for Mounting / Dismounting of Switch Box

1.1 Procedure for Dismounting

1. Dismount the lid from the switch box.
2. Disconnect high voltage and low voltage wirings from the PC board and the terminal blocks, referring to Figure on the right.
3. Unscrew mounting screws from the top plate, the stop valve mounting plate, and the bottom frame in a total of 6 places.
4. With attention paid not to make the switch box support leg into contact with the side panel, rotate the switch box to pull out it, while referring to Figure on the right.
   In order to pull out the switch box, check to be sure no wirings get stuck with the switch box.

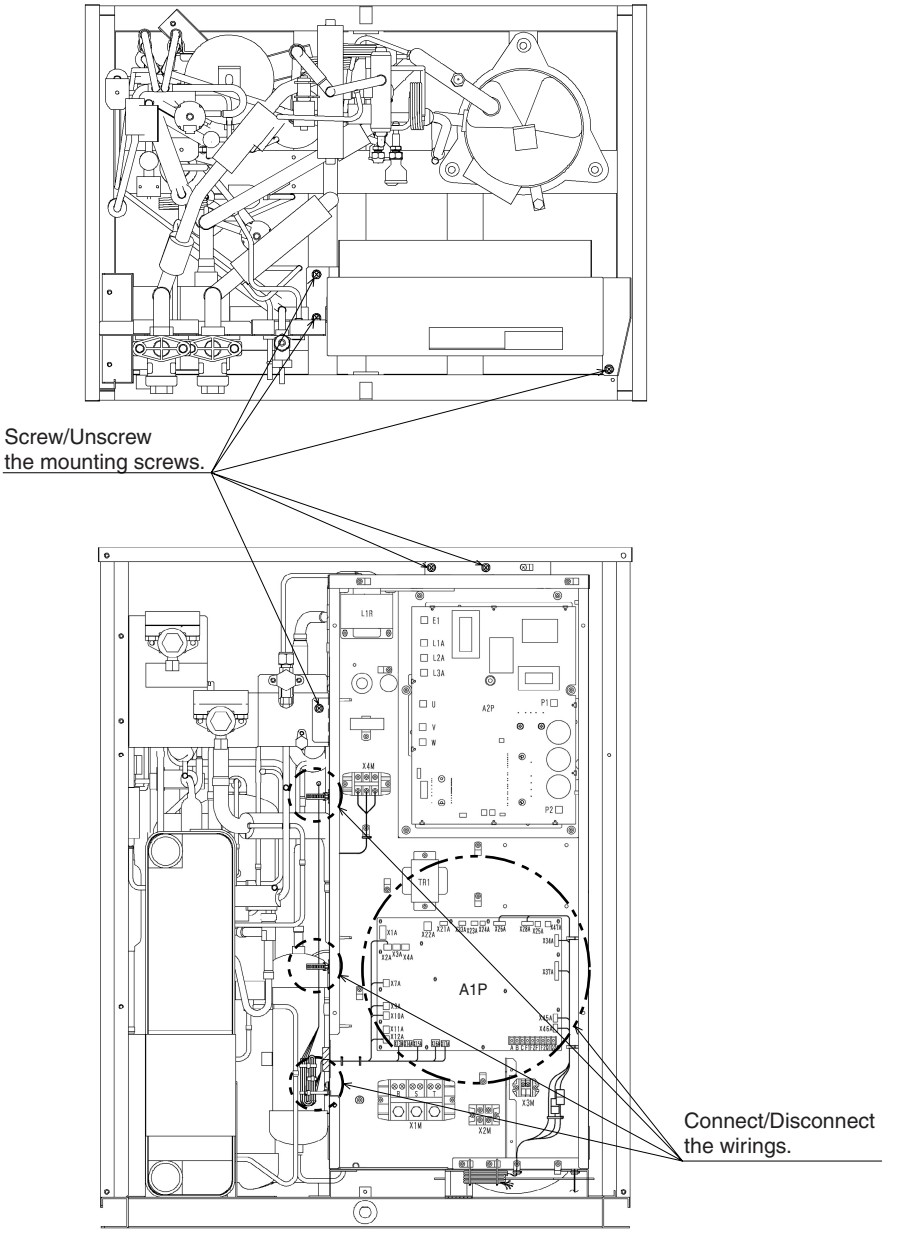


Procedure for Mounting/Dismounting of Switch Box

1.2 Procedure for Mounting

- Mount the switch box, following the procedure for dismounting in reverse.
  After the completion of mounting, check to be sure connectors are all properly connected.

List of Detachable Connectors				
High voltage wiring	A1P	X7A	White (WHT)	Y1S
		X9A	Blue (BLU)	Y3S
		X10A	Pink (PNK)	Y4S
		X12A	Gray (GRY)	Y6S
		X2A	Red (RED)	S1PH
		X17A	Gray (GRY)	E1HC
		X13A	Green (GRN)	Y2S
		X15A	Blue (BLU)	Y5S
		X16A	Black (BLK)	Y7S
	X4M	U, V, W		M1C
Low voltage wiring	A1P	X34A	Red (RED)	R3T
		X37A	White (WHT)	R2T
		X37A	White (WHT)	R4T
		X37A	White (WHT)	R5T
		X37A	White (WHT)	R6T
		X46A	Red (RED)	S1NPH
		X45A	Blue (BLU)	S1NPL
		X26A	White (WHT)※	Y1E
		X28A	Blue (BLU)※	Y3E
		※ Attach or detach any connector at the relay connector.		


Screw/Unscrew
the mounting screws.
A1P
Connect/Disconnect
the wirings.

Part 8
Appendix

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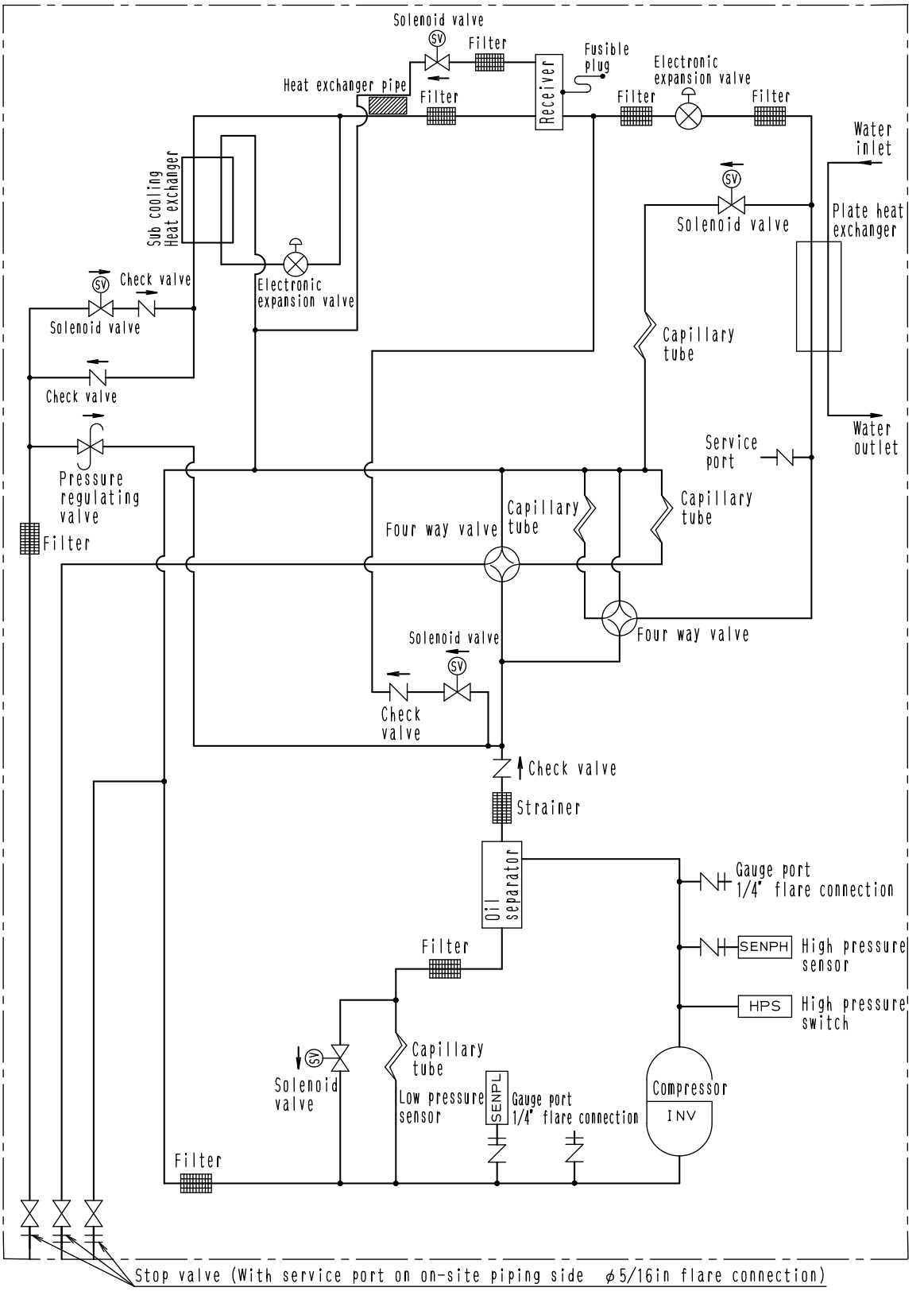
   7.1 Method of Replacing the Inverter's Power Transistors and Diode Modules 281

1. Piping Diagrams

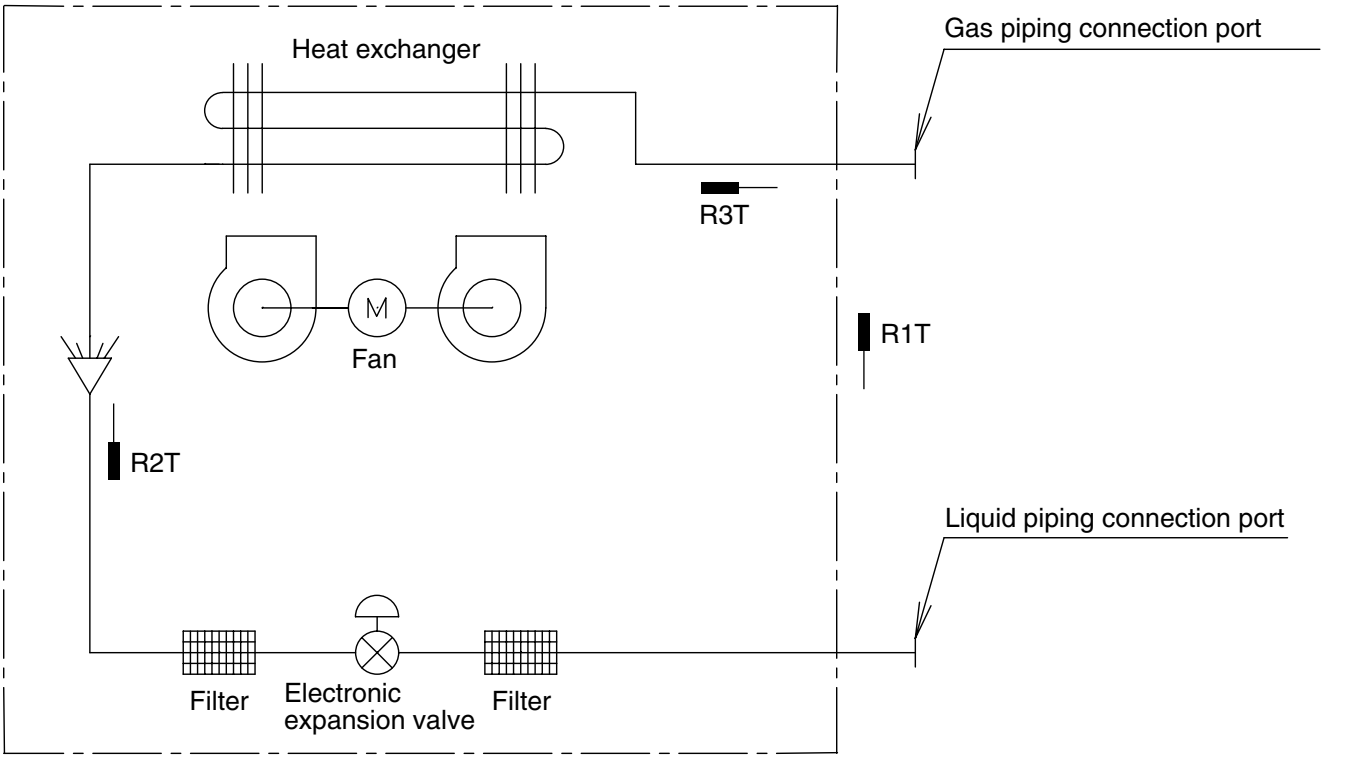
1.1 Outside Units

RWEYQ60MTJU / RWEYQ72MTJU / RWEYQ84MTJU



1.2 Indoor Unit

FXFQ 12M / 18M / 24M / 30M / 36MVJU
FXSQ 12M / 18M / 24M / 30M / 36M / 48MVJU
FXMQ 30M / 36M / 48MVJU
FXHQ 12M / 24M / 36MVJU
FXAQ 07M / 09M / 12M / 18M / 24MVJU
FXLQ 12M / 18M / 24MVJU
FXNQ 12M / 18M / 24MVJU

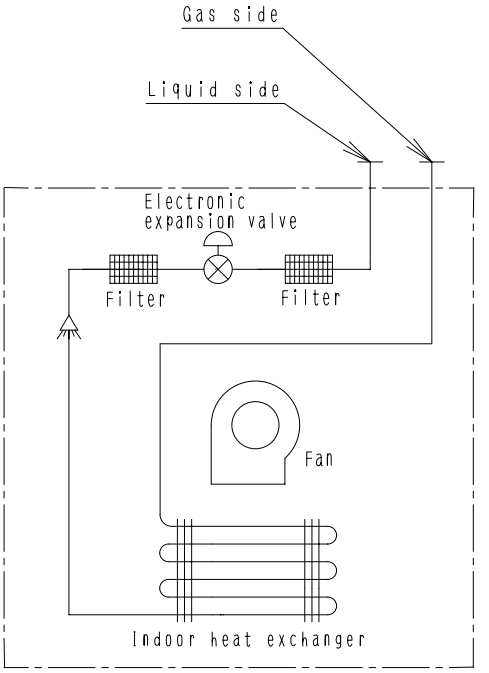


J:DU220-602J

R1T : Thermistor for suction air temperature
R2T : Thermistor for liquid line temperature
R3T : Thermistor for gas line temperature

Capacity	GAS	Liquid
07/09/12/18M	ϕ1/2	ϕ1/4
24/30/36/48M	ϕ5/8	ϕ3/8

FXDQ



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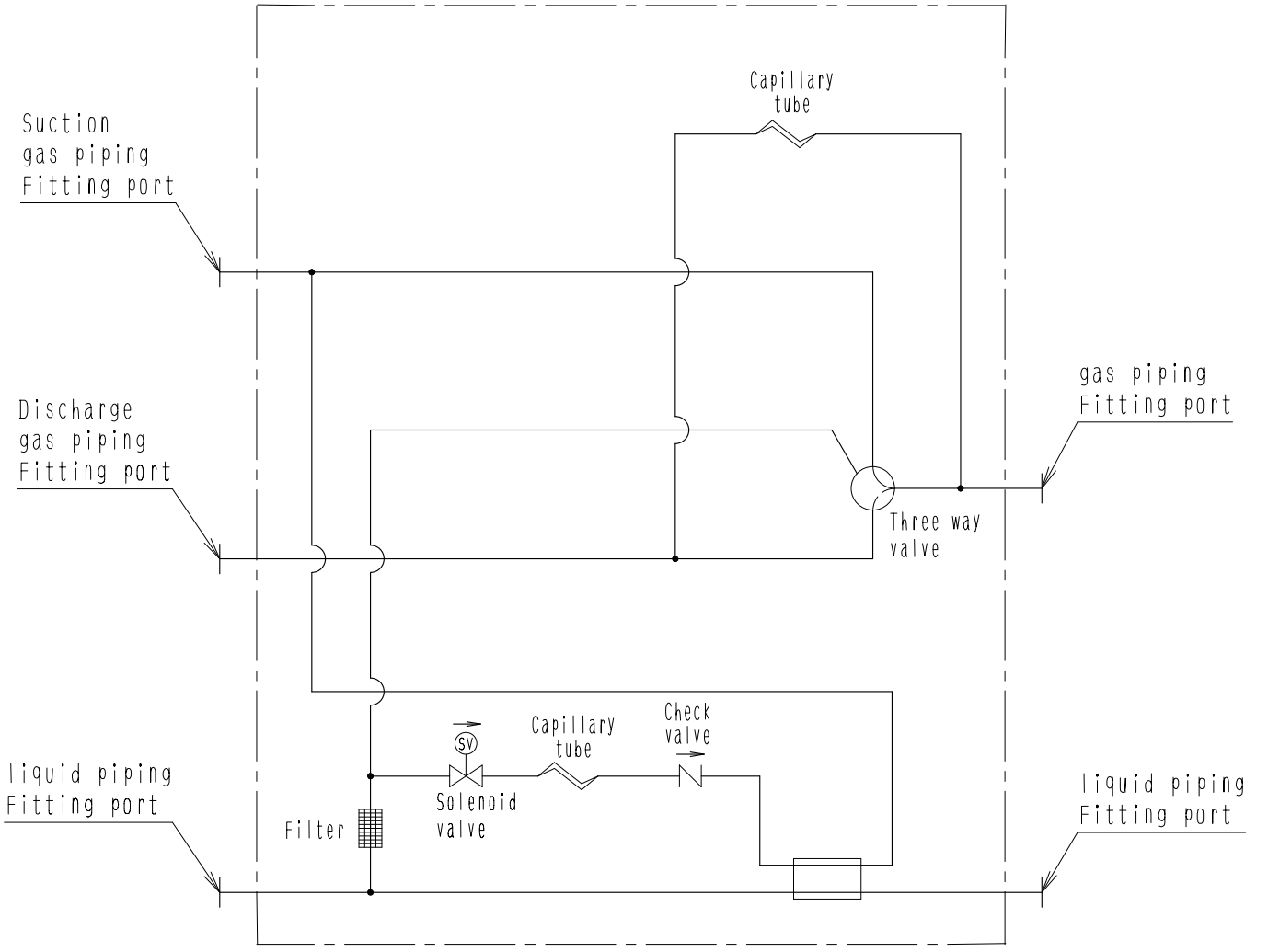
■ Refrigerant pipe connection port diameters

Model	Gas	Liquid
FXDQ07M / 09M / 12M / 18MVJU	ϕ1/2	ϕ1/4
FXDQ24MVJU	ϕ5/8	ϕ3/8

1.3 BS Unit

BSVQ36MVJU
BSVQ60MVJU



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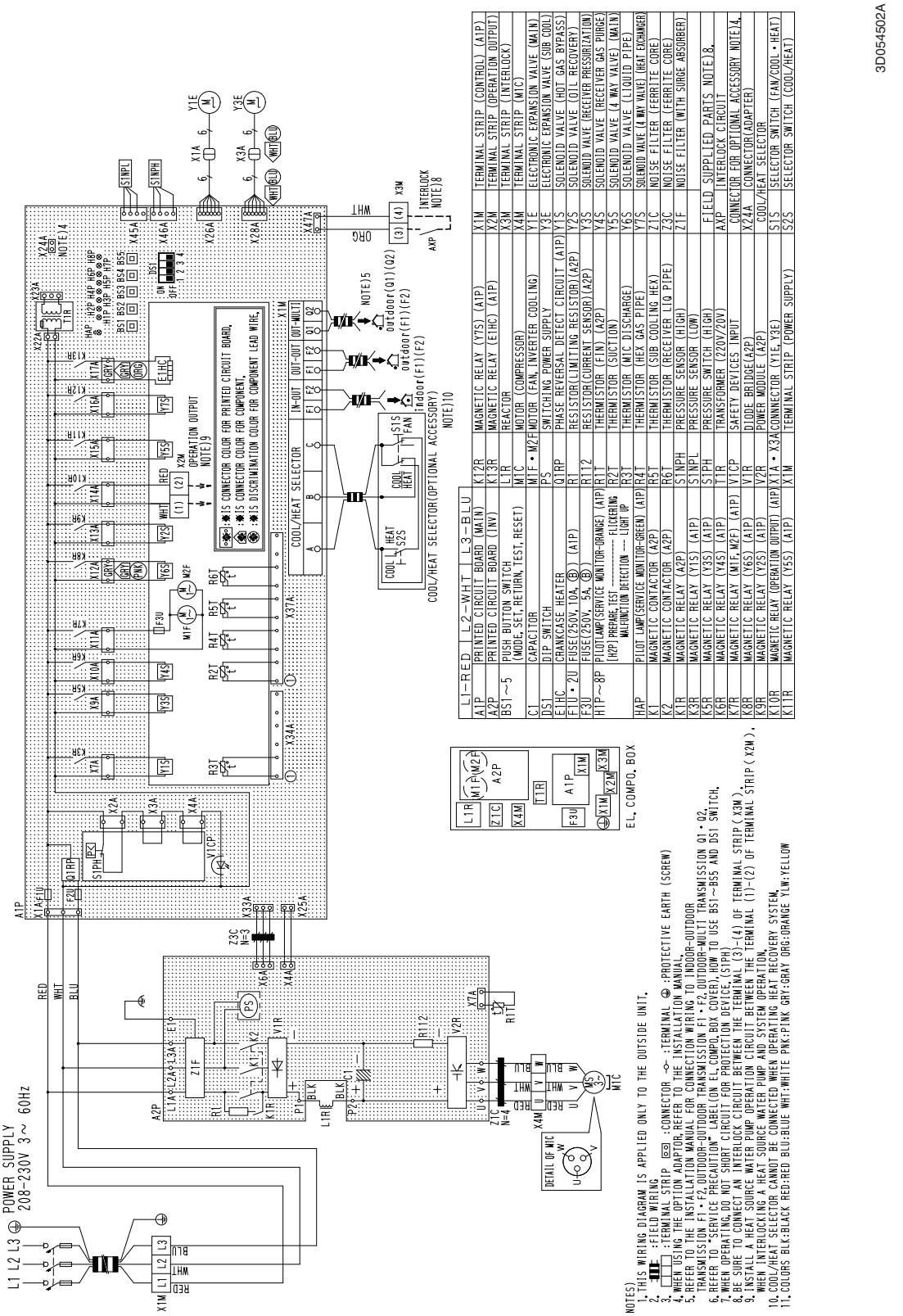
2. Wiring Diagrams

2.1 Outside Unit

RWEYQ60MTJU / RWEYQ72MTJU / RWEYQ84MTJU

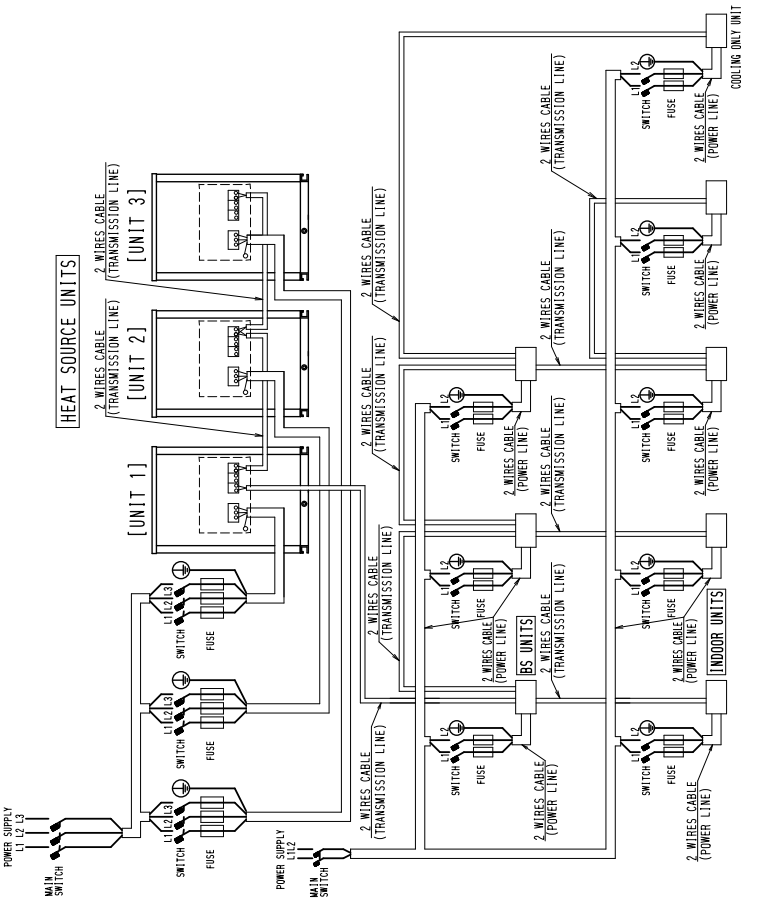


2.2 Outside Unit Field Wiring

RWEYQ60, 72, 84, 144, 168, 216, 252MTJU [Operation System : Heat Recovery]

[Operation system : Heat Recovery]

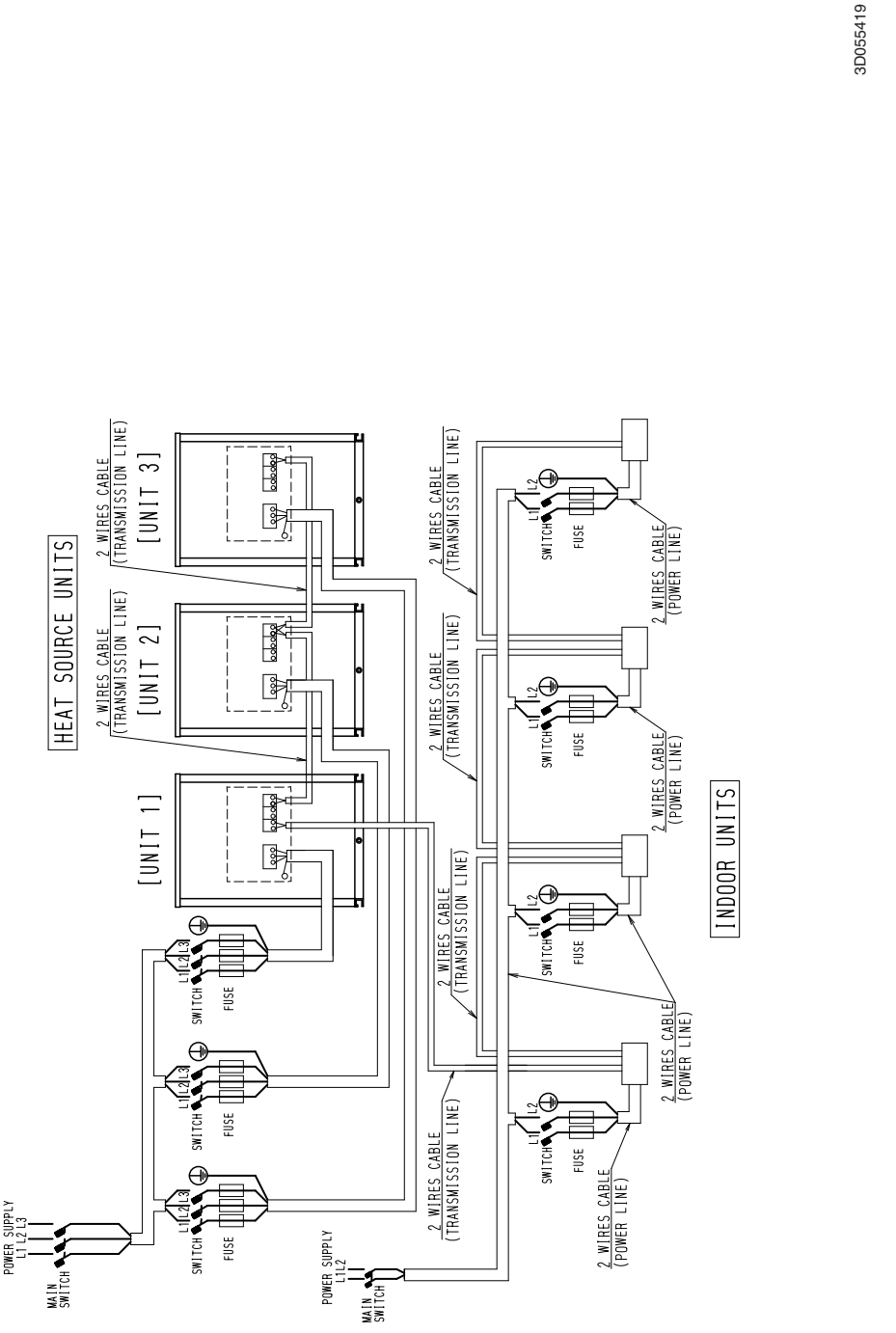
Notes 1) All wiring, components and materials to be procured on the site must comply with the National Electrical Code (NEC) and applicable local codes.
2) Use copper conductors only.
3) As for details, see wiring diagram.
4) Install fused disconnects per NEC for safety.
5) All field wiring and components must be provided by licensed electrician.
6) Unit shall be grounded in compliance with the NEC and the applicable local codes.
7) Wiring shown is general points-of-connection guides only and is not intended for or to include all details for a specific installation.
8) Be sure to install the switch and the fuse to the power line of each unit.
9) Install the main switch that can interrupt all the power souces in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10) If there exists the possibility of reversed phase, lose phase, momentary blackout or the power goes on and off while the units are operating, attach a reversed phase protection circuit locally.
Operating the units in reversed phase may break the compressors and other parts.



RWEYQ60, 72, 84, 144, 168, 216, 252MTJU [Operation System : Heat Pump]

[Operation System : Heat Pump]

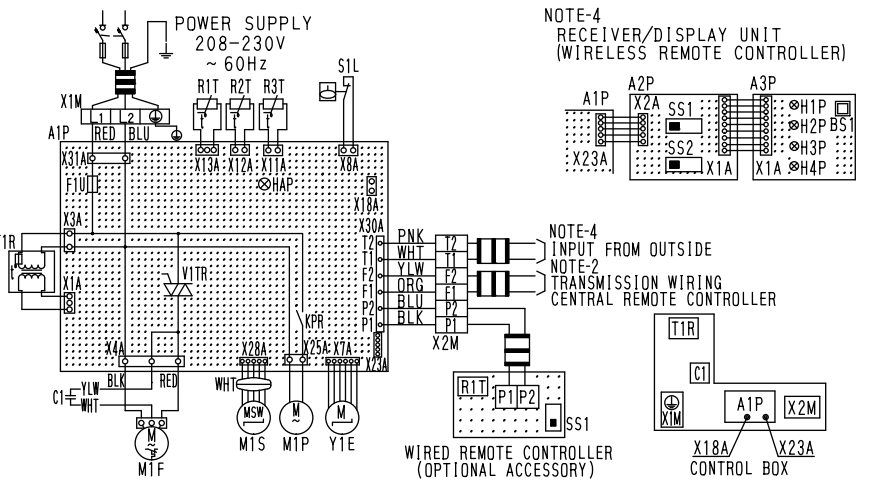
Notes 1) All wiring, components and materials to be procured on the site must comply with the National Electrical Code (NEC) and applicable local codes.
2) Use copper conductors only.
3) As for details, see wiring diagram.
4) Install fused disconnects per NEC for safety.
5) All field wiring and components must be provided by licensed electrician.
6) Unit shall be grounded in compliance with the NEC and the applicable local codes.
7) Wiring shown is general points-of-connection guides only and is not intended for or to include all details for a specific installation.
8) Be sure to install the switch and the fuse to the power line of each unit.
9) Install the main switch that can interrupt all the power souces in an integrated manner because this system consists of the equipment utilizing the multiple power sources.
10) If there exists the possibility of reversed phase, lose phase, momentary blackout or the power goes on and off while the units are operating, attach a reversed phase protection circuit locally.
Operating the units in reversed phase may break the compressors and other parts.



2.3 Indoor Unit

FXFQ12M/18M/24M/30M/36MVJU

	INDOOR UNIT		RECEIVER/DISPLAY UNIT(ATTACHED TO WIRELESS REMOTE CONTROLLER)
A1P	PRINTED CIRCUIT BOARD		
C1	CAPACITOR(M1F)	A2P	PRINTED CIRCUIT BOARD
F1U	FUSE (Ⓑ5A/250V)	A3P	PRINTED CIRCUIT BOARD
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)	BS1	PUSH BUTTON(ON/OFF)
		H1P	LIGHT EMITTING DIODE (ON-RED)
KPR	MAGNETIC RELAY(M1P)		
M1F	MOTOR(INDOOR FAN)	H2P	LIGHT EMITTING DIODE (TIMER-GREEN)
M1P	MOTOR(DRAIN PUMP)		
M1S	MOTOR(SWING FLAP)	H3P	LIGHT EMITTING DIODE (FILTER SIGN-RED)
Q1F	THERMO SWITCH(M1F EMBEDDED)		
R1T	THERMISTOR(AIR)	H4P	LIGHT EMITTING DIODE (DEFROST-ORANGE)
R2T・3T	THERMISTOR(COIL)		
S1L	FLOAT SWITCH	SS1	SELECTOR SWITCH (MAIN/SUB)
T1R	TRANSFORMER(208-230V/22V)		
V1TR	TRIAC	SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)
X1M	TERMINAL STRIP(POWER)		
X2M	TERMINAL STRIP(CONTROL)	CONNECTOR FOR OPTIONAL PARTS	
Y1E	ELECTRONIC EXPANSION VALVE	X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTORICAL APPENDICES)
WIRED REMOTE CONTROLLER		X23A	CONNECTOR(WIRELESS REMOTE CONTROLLER)
R1T	THERMISTOR(AIR)		
SS1	SELECTOR SWITCH(MAIN/SUB)		

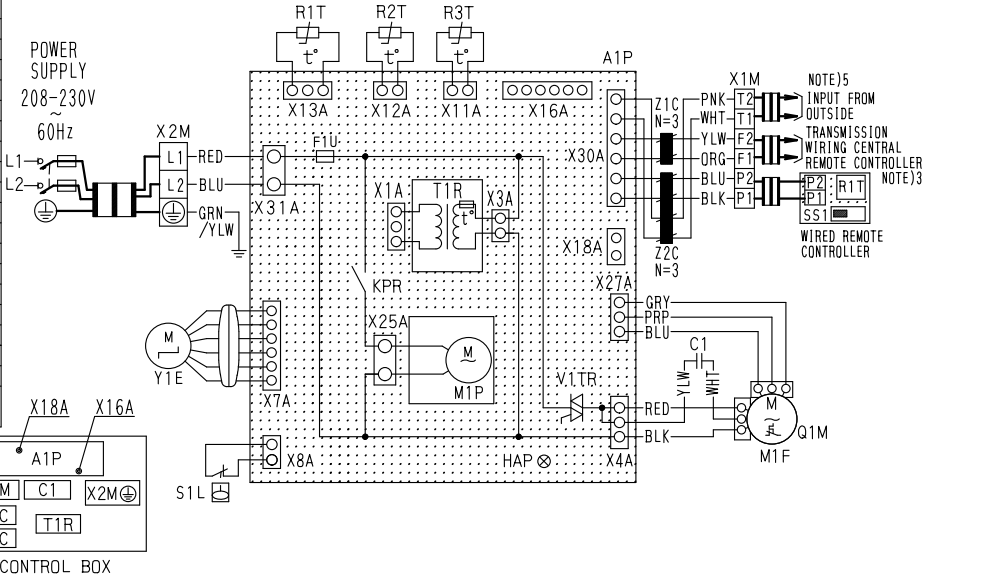


NOTES)
1. □□□□:TERMINAL
   ⊙⊙ , ⊂⊃ : CONNECTOR
   ═══: FIELD WIRING
2. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
3. X23A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS BEING USED.
4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER.
   IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
5. SYMBOLS SHOW AS FOLLOWS
   (BLK:BLACK BLU:BLUE ORG:ORANGE PNK:PINK
   RED:RED WHT:WHITE YLW:YELLOW)
6. USE COPPER CONDUCTORS ONLY.

3D042620B

FXDQ07M/09M/12M/18M/24MVJU

A1P	PRINTED CIRCUIT BOARD
C1	CAPACITOR(M1F)
F1U	FUSE(F5A/250V)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)
KPR	MAGNETIC RELAY(M1P)
M1F	MOTOR(INDOOR FAN)
M1P	MOTOR(DRAIN PUMP)
Q1M	THERMAL PROTECTOR(M1F EMBEDDED)
R1T	THERMISTOR(AIR)
R2T	THERMISTOR(COIL-1)
R3T	THERMISTOR(COIL-2)
S1L	FLOAT SWITCH
T1R	TRANSFORMER(208-230V/25V)
V1TR	PHASE CONTROL CIRCUIT
X1M	TERMINAL BLOCK
X2M	TERMINAL BLOCK
Y1E	ELECTRONIC EXPANSION VALVE
Z1C・Z2C	NOISE FILTER (FERRITE CORE)
WIRED REMOTE CONTROLLER	
R1T	THERMISTOR(AIR)
SS1	SELECTOR SWITCH(MAIN/SUB)
CONNECTOR FOR OPTIONAL PARTS	
X16A	CONNECTOR(ADAPTOR FOR WIRING)
X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTRICAL APPENDICES)

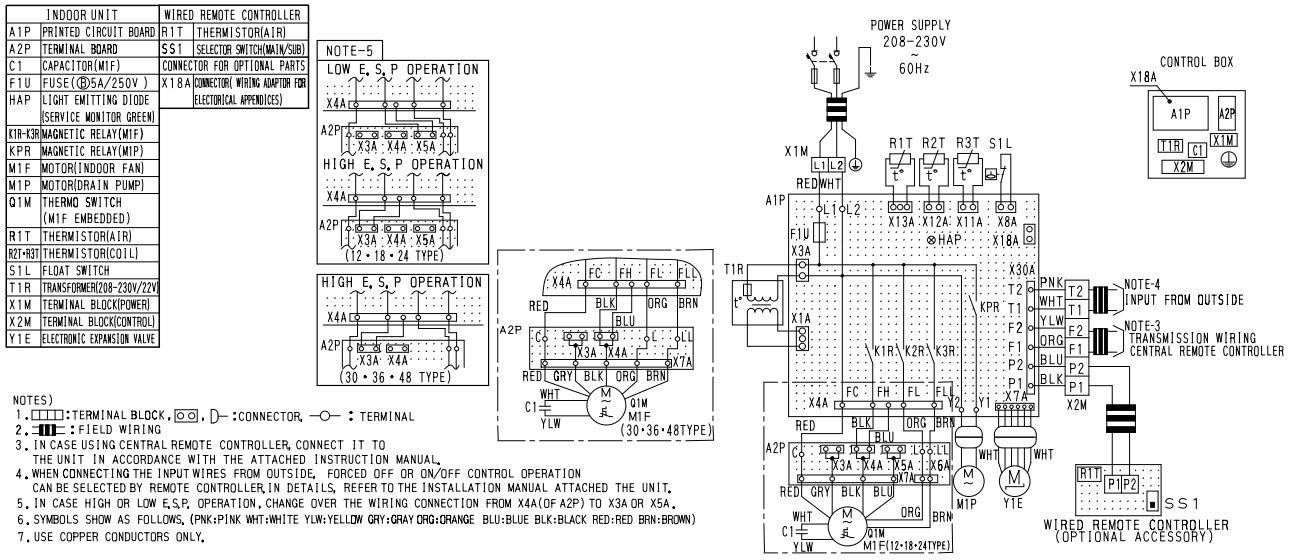


NOTES)
1. □□□ : TERMINAL
   ⊙⊙ , ⊂⊃ : CONNECTOR
2. ═══ : FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
4. REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM, CONFIRM ENGINEERING MATERIALS AND CATALOGS, ETC. BEFORE CONNECTING.
5. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED TO THE UNIT.
6. SYMBOLS SHOW AS FOLLOWS: RED:RED BLK:BLACK WHT:WHITE YLW:YELLOW PRP:PURPLE GRY:GRAY BLU:BLUE PNK:PINK ORG:ORANGE GRN:GREEN

3D050501A

FXSQ12M/18M/24M/30M/36M/48MVJU

INDOOR UNIT		WIRED REMOTE CONTROLLER	
A1P	PRINTED CIRCUIT BOARD	R1T	THERMISTOR(AIR)
A2P	TERMINAL BOARD	SS1	SELECTOR SWITCH(MAIN/SUB)
C1	CAPACITOR(M1F)	CONNECTOR FOR OPTIONAL PARTS	
F1U	FUSE(Ⓑ5A/250V)	X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTORICAL APPENDICES)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)		
K1R-K3R	MAGNETIC RELAY(M1F)		
KPR	MAGNETIC RELAY(M1P)		
M1F	MOTOR(INDOOR FAN)		
M1P	MOTOR(DRAIN PUMP)		
Q1M	THERMO SWITCH (M1F EMBEDDED)		
R1T	THERMISTOR(AIR)		
R2T•R3T	THERMISTOR(COIL)		
S1L	FLOAT SWITCH		
T1R	TRANSFORMER(208-230V/22V)		
X1M	TERMINAL BLOCK(POWER)		
X2M	TERMINAL BLOCK(CONTROL)		
Y1E	ELECTRONIC EXPANSION VALVE		

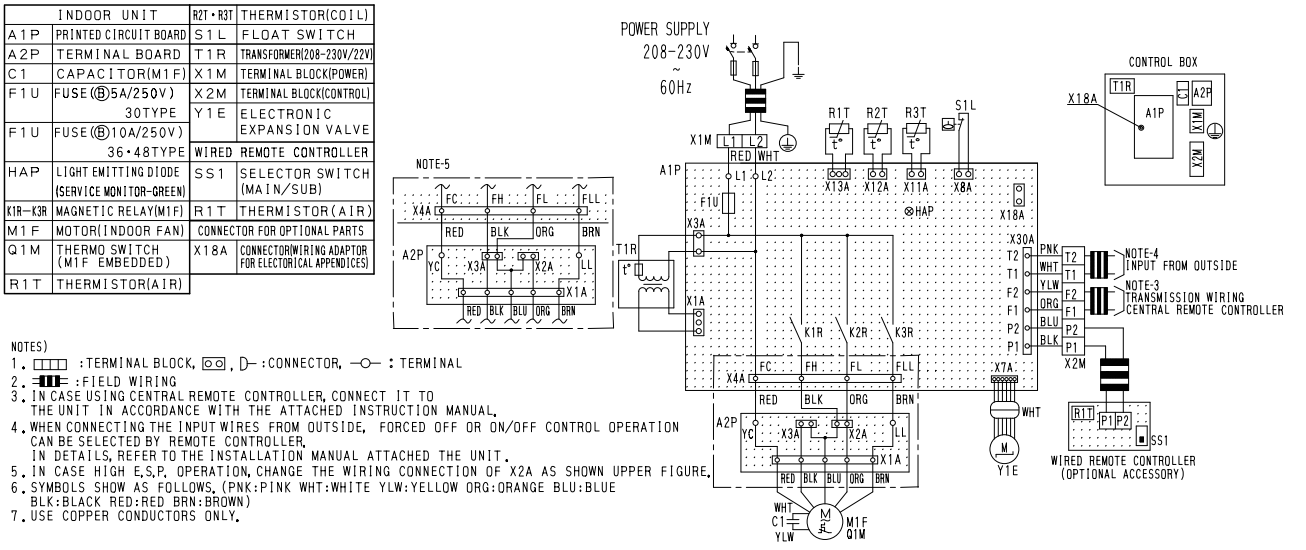


NOTES)
1. □□□:TERMINAL BLOCK, ⊙⊙, ⊐ :CONNECTOR, —○— : TERMINAL
2. ▮▮▮ : FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER.IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
5. IN CASE HIGH OR LOW E.S.P. OPERATION, CHANGE OVER THE WIRING CONNECTION FROM X4A(OF A2P) TO X3A OR X5A.
6. SYMBOLS SHOW AS FOLLOWS. (PNK:PINK WHT:WHITE YLW:YELLOW GRY:GRAY ORG:ORANGE BLU:BLUE BLK:BLACK RED:RED BRN:BROWN)
7. USE COPPER CONDUCTORS ONLY.

3D043177A

FXMQ30M/36M/48MVJU

INDOOR UNIT		R2T・R3T	THERMISTOR(COIL)
A1P	PRINTED CIRCUIT BOARD	S1L	FLOAT SWITCH
A2P	TERMINAL BOARD	T1R	TRANSFORMER(208-230V/22V)
C1	CAPACITOR(M1F)	X1M	TERMINAL BLOCK(POWER)
F1U	FUSE(Ⓑ5A/250V) 30TYPE	X2M	TERMINAL BLOCK(CONTROL)
		Y1E	ELECTRONIC EXPANSION VALVE
F1U	FUSE(Ⓑ10A/250V) 36・48TYPE	WIRED REMOTE CONTROLLER	
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)	SS1	SELECTOR SWITCH (MAIN/SUB)
K1R-K3R	MAGNETIC RELAY(M1F)	R1T	THERMISTOR(AIR)
M1F	MOTOR(INDOOR FAN)	CONNECTOR FOR OPTIONAL PARTS	
Q1M	THERMO SWITCH (M1F EMBEDDED)	X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTORICAL APPENDICES)
R1T	THERMISTOR(AIR)		

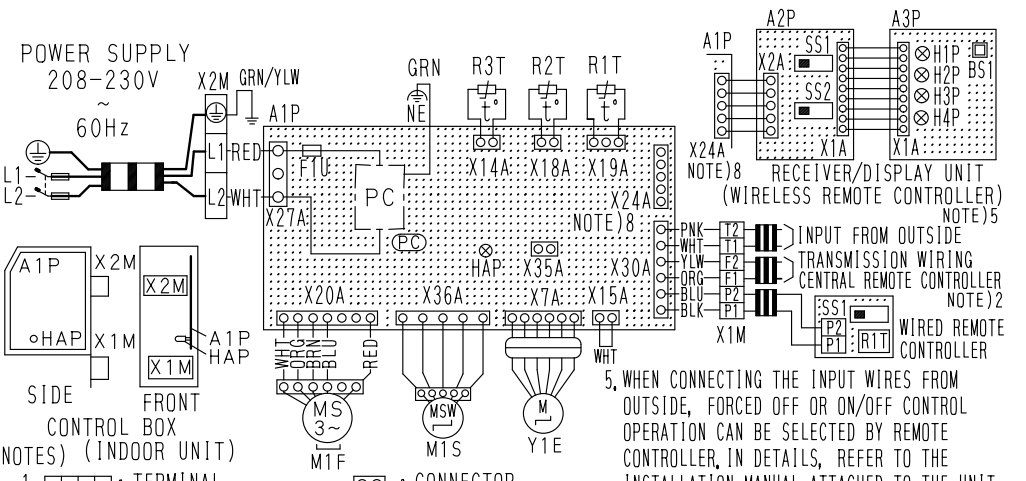


NOTES)
1. □□□ :TERMINAL BLOCK, ⊙⊙, ⊐ :CONNECTOR, —○— : TERMINAL
2. ▮▮▮ :FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
5. IN CASE HIGH E.S.P. OPERATION, CHANGE THE WIRING CONNECTION OF X2A AS SHOWN UPPER FIGURE.
6. SYMBOLS SHOW AS FOLLOWS. (PNK:PINK WHT:WHITE YLW:YELLOW ORG:ORANGE BLU:BLUE BLK:BLACK RED:RED BRN:BROWN)
7. USE COPPER CONDUCTORS ONLY.

3D043176A

FXAQ07M/09M/12M/18M/24MVJU

INDOOR UNIT	
A1P	PRINTED CIRCUIT BOARD
F1U	FUSE(T 3.15AH 250V)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)
M1F	MOTOR(INDOOR FAN)
M1S	MOTOR(SWING FLAP)
R1T	THERMISTOR(AIR)
R2T	THERMISTOR(COIL LIQUID PIPE)
R3T	THERMISTOR(COIL GAS PIPE)
X1M	TERMINAL BLOCK(CONTROL)
X2M	TERMINAL BLOCK(POWER)
Y1E	ELECTRONIC EXPANSION VALVE
PC	POWER CIRCUIT
	RECEIVER/DISPLAY UNIT(ATTACHED TO WIRELESS REMOTE CONTROLLER)
A2P	PRINTED CIRCUIT BOARD
A3P	PRINTED CIRCUIT BOARD
BS1	PUSH BUTTON(ON/OFF)
H1P	LIGHT EMITTING DIODE(ON-RED)
H2P	LIGHT EMITTING DIODE (TIMER-GREEN)
H3P	LIGHT EMITTING DIODE (FILTER SIGN-RED)
H4P	LIGHT EMITTING DIODE (DEFROST-ORENGE)
SS1	SELECTOR SWITCH(MAIN/SUB)
SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)



NOTES) (INDOOR UNIT)

1. □□□□ : TERMINAL ⊙⊙ : CONNECTOR
   ≡ : FIELD WIRING ⊙⊙ : CONNECTOR
2. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
3. SYMBOLS SHOWS AS FOLLOWS: RED:RED WHT:WHITE GRN:GREEN PNK:PINK YLW:YELLOW BLK:BLACK ORG:ORANGE BRN:BROWN BLU:BLUE
4. ⊙⊙ SHOWS SHORT CIRCUIT CONNECTOR.
5. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED TO THE UNIT.
6. REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM, CONFIRM ENGINEERING DATA AND CATALOGS, ETC. BEFORE CONNECTING.
7. CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCH(SS1, SS2) OF WIRED REMOTE CONTROLLER AND WIRELESS REMOTE CONTROLLER BY INSTALLATION MANUAL AND ENGINEERING DATA, ETC.
8. X24A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS USED.

WIRED REMOTE CONTROLLER		CONNECTOR FOR OPTIONAL PARTS	
R1T	THERMISTOR(AIR)	X15A	CONNECTOR(FLOAT SWITCH)
SS1	SELECTOR SWITCH(MAIN/SUB)	X35A	CONNECTOR(GROUP CONTROL ADAPTOR)

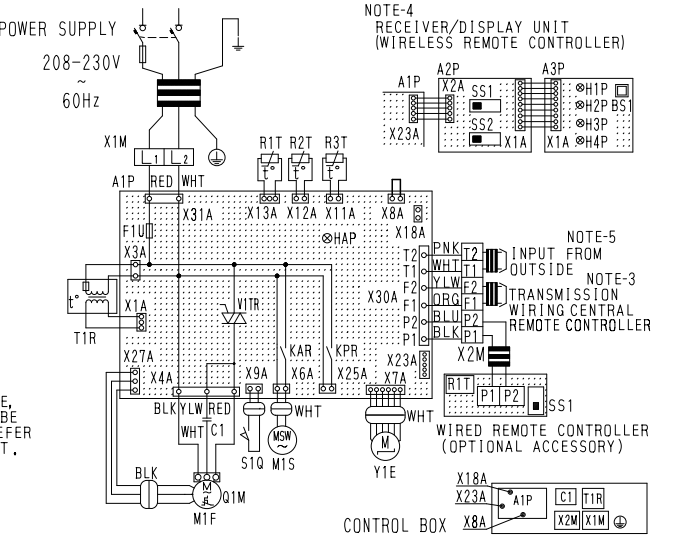
3D046039C

FXHQ12M/24M/36M

INDOOR UNIT	
A1P	PRINTED CIRCUIT BOARD
C1	CAPACITOR(M1F)
F1U	FUSE(Ⓑ5A,250V)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)
KAR	MAGNETIC RELAY(M1S)
KPR	MAGNETIC RELAY
M1F	MOTOR (INDOOR FAN)
M1S	MOTOR (SWING FLAP)
Q1M	THERMO SWITCH(M1F EMBEDDED)
R1T	THERMISTOR(AIR)
R2T	THERMISTOR(COIL LIQUID)
R3T	THERMISTOR(COIL GAS)
S1Q	LIMIT SWITCH(SWING FLAP)
T1R	TRANSFORMER(208-230V/25V)
V1TR	TRIAC
X1M	TERMINAL BLOCK(POWER)
X2M	TERMINAL BLOCK(CONTROL)
Y1E	ELECTRONIC EXPANSION VALVE
	WIRED REMOTE CONTROLLER
R1T	THERMISTOR(AIR)
SS1	SELECTOR SWITCH(MAIN/SUB)
	RECEIVER/DISPLAY UNIT(ATTACHED TO WIRELESS REMOTE CONTROLLER)
A2P	PRINTED CIRCUIT BOARD
A3P	PRINTED CIRCUIT BOARD
BS1	PUSH BUTTON(ON/OFF)
H1P	LIGHT EMITTING DIODE(ON-RED)
H2P	LIGHT EMITTING DIODE (TIMER-GREEN)
H3P	LIGHT EMITTING DIODE (FILTER SIGN-RED)
H4P	LIGHT EMITTING DIODE (DEFROST-ORANGE)
SS1	SELECTOR SWITCH(MAIN/SUB)
SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)
	CONNECTOR FOR OPTIONAL PARTS
X18A	CONNECTOR (WIRING ADAPTOR FOR ELECTRICAL APPENDICES)
X23A	CONNECTOR (WIRELESS REMOTE CONTROLLER)

NOTES)

1. □□□□ :TERMINAL BLOCK ⊙⊙, ⊙⊙ :CONNECTOR
   ⊙⊙ : SHORT CIRCUIT CONNECTOR
2. ≡ :FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTRUCTION MANUAL.
4. X23A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS BEING USED.
5. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED THE UNIT.
6. SYMBOLS SHOW AS FOLLOWS.
   (BLU:BLUE BLK:BLACK ORG:ORANGE PNK:PINK
   RED:RED WHT:WHITE YLW:YELLOW)
7. USE COPPER CONDUCTORS ONLY.

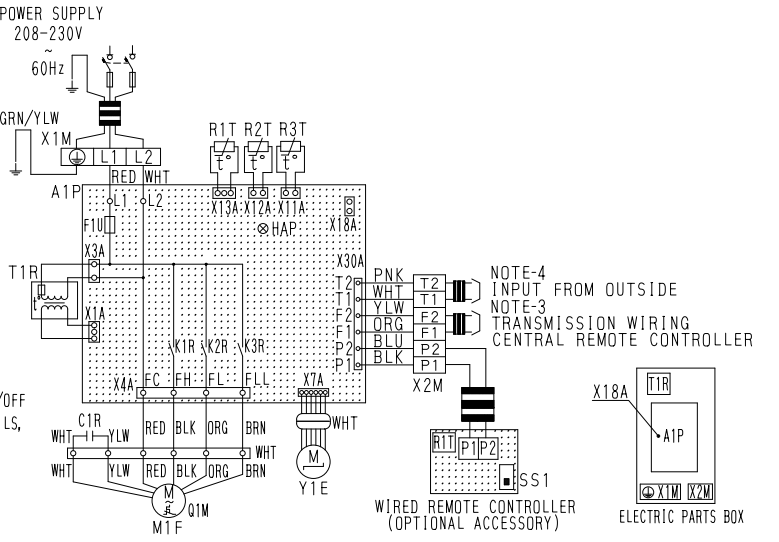


3D048116

FXLQ12M/18M/24MVJU
FXNQ12M/18M/24MVJU

INDOOR UNIT			
A1P	PRINTED CIRCUIT BOARD	X2M	TERMINAL BLOCK(CONTROL)
C1R	CAPACITOR (M1F)	Y1E	ELECTRONIC EXPANSION VALVE
F1U	FUSE(Ⓑ,5A, 250V)	WIRED REMOTE CONTROLLER	
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR-GREEN)	R1T	THERMISTOR(AIR)
		SS1	SELECTOR SWITCH (MAIN/SUB)
K1R-K3R	MAGNETIC RELAY(M1F)	CONNECTOR FOR OPTIONAL PARTS	
M1F	MOTOR (INDOOR FAN)	X18A	CONNECTOR(WIRING ADAPTOR FOR ELECTORICAL APPENDICES)
Q1M	THERMO SWITCH (M1F EMBEDDED)		
R1T	THERMISTOR(AIR)		
R2T・R3T	THERMISTOR(COIL)		
T1R	TRANSFORMER(208-230V/25V)		
X1M	TERMINAL BLOCK(POWER)		

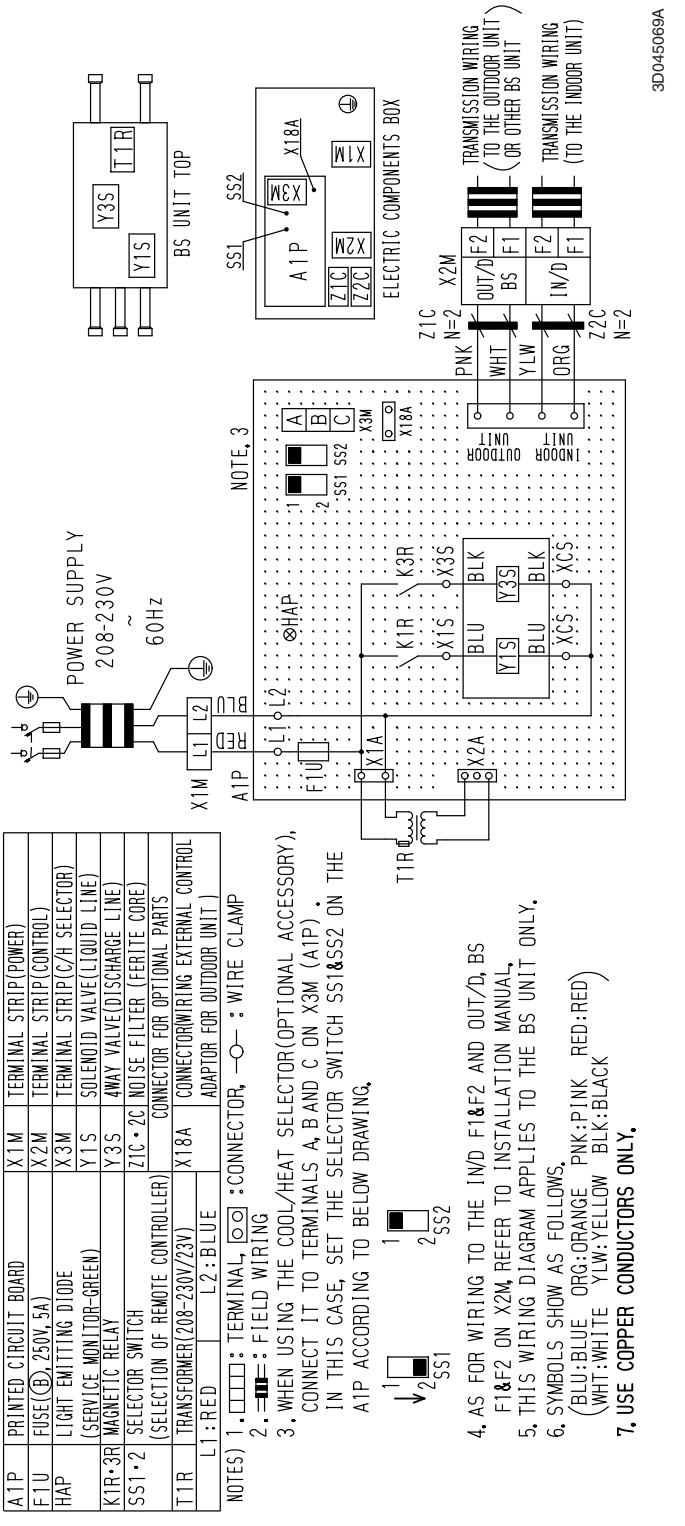
NOTES)
1. ▭▭:TERMINAL BLOCK, ⊙⊙, ⊃⊢:CONNECTOR, -o-:TERMINAL
2. ▭▮▮▭:FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
4. WHEN CONNECTING THE INPUT WIRES FROM OUTSIDE, FORCED OFF OR ON/OFF CONTROL OPERATION CAN BE SELECTED BY REMOTE CONTROLLER. IN DETAILS, REFER TO THE INSTALLATION MANUAL ATTACHED TO THE UNIT.
5. SYMBOLS SHOW AS FOLLOWS. (PNK:PINK WHT:WHITE YLW:YELLOW ORG:ORANGE BLU:BLUE BLK:BLACK RED:RED BRN:BROWN)
6. USE COPPER CONDUCTORS ONLY.



3D045644A

2.4 BS Unit

BSVQ36M / 60MVJU



3. List of Electrical and Functional Parts

3.1 Outside Unit

3.1.1 RWEYQ60, 72, 84MTJU

Item	Name		Symbol	Model
				RWEYQ60M, 72M, 84MTJU
Compressor	Inverter	Type	M1C	JT100GCVDK@SA
		OC protection device		26.5A
Electronic expansion valve (Main)			Y1E	Fully closed: 0pls Fully open: 2000pls
Electronic expansion valve (Subcool)			Y2E	Fully closed: 0pls Fully open: 2000pls
Pressure protection	High pressure switch	For M1C	HPS	OFF: 580 $^{+0}_{-17.4}$ Psi ON: 435±21.75Psi
	Low pressure sensor		S1NPL	OFF: 10.15Psi
	Fusible plug		—	Open: 158~167°F
Temperature protection	Discharge gas temperature protection (Discharge pipe thermistor)		R3T	OFF: 275°F
	Inverter fin temperature protection (Radiator fin thermistor)		R1T	OFF: 188.6°F
Others	Fuse	For main PC board	F1U	250V AC 10A Class B
			F2U	250V AC 10A Class B
		For cooling fan motor	F3U	250V AC 5A Class B

3.2 Indoor Side

3.2.1 Indoor Unit

Parts Name		Symbol	Model					Remark
			FXFQ 12MVJU	FXFQ 18MVJU	FXFQ 24MVJU	FXFQ 30MVJU	FXFQ 36MVJU	
Remote Controller	Wired Remote Controller		BRC1C71					Option
	Wireless Remote Controller		BRC7C812					
Motors	Fan Motor	M1F	1ϕ45W 6P			1ϕ90W 6P		
			Thermal Protector 266°F : OFF 176°F : ON					
	Capacitor, fan motor	C1	3.5μF 450VAC			5.0μF 450VAC		
	Drain Pump	M1P	PLD-12230DM Thermal Fuse 293°F					
	Swing Motor	M1S	MP35HCA [3P007482-1]					
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-1 ϕ4 L250 20kΩ (77°F)					
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-3 ϕ8 L630 20kΩ (77°F)					
	Thermistor (Heat Exchanger)	R2T	ST8602A-3 ϕ6 L630 20kΩ (77°F)					
Others	Float Switch	S1L	FS-0211					
	Fuse	F1U	250V 5A ϕ5.2					
	Transformer	T1R	TR25H25R0					

Parts Name		Symbol	Model					Remark
			FXDQ 07MVJU	FXDQ 09MVJU	FXDQ 12MVJU	FXDQ 18MVJU	FXDQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1C71					Option
	Wireless Remote Controller		BRC4C82					
Motors	Fan Motor	M1F	1ϕ62W 4P			1ϕ13W 4P		
			Thermal Protector 266±9°F : OFF 181±27°F : ON					
	Capacitor, fan motor	C1	4.0μF 450VAC			7.0μF 450VAC		
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-1 ϕ4 L250 20kΩ (77°F)					
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-4 ϕ8 L800 20kΩ (77°F)					
	Thermistor (Heat Exchanger)	R2T	ST8602A-4 ϕ6 L800 20kΩ (77°F)					
Others	Float Switch	S1L	FS-0211					
	Transformer	T1R	TR25H25R0					

Parts Name		Symbol	Model						Remark
			FXSQ 12MVJU	FXSQ 18MVJU	FXSQ 24MVJU	FXSQ 30MVJU	FXSQ 36MVJU	FXSQ 48MVJU	
Remote Controller	Wired Remote Controller		BRC1C71						Option
	Wireless Remote Controller		BRC4C82						
Motors	Fan Motor	M1F	1ϕ50W 4P	1ϕ85W 4P	1ϕ125W 4P	1ϕ225W 4P			
			Thermal Fuse 305.6°F			Thermal protector 275°F : OFF 188.6°F : ON			
	Drain Pump	M1P	PLD-12230DM Thermal Fuse 336.2°F						
Thermistors	Thermistor (Suction Air)	R1T	ST8601-13 ϕ4 L630 20kΩ (77°F)						
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-7 ϕ8 L1600 20kΩ (77°F)						
	Thermistor (Heat Exchanger)	R2T	ST8602A-7 ϕ6 L1600 20kΩ (77°F)						
Others	Float Switch	S1L	FS-0211						
	Fuse	F1U	250V 5A ϕ5.2						
	Transformer	T1R	TR25H25R0						

Parts Name		Symbol	Model			Remark
			FXMQ 30MVJU	FXMQ 36MVJU	FXMQ 48MVJU	
Remote Controller	Wired Remote Controller		BRC1C71			Option
	Wireless Remote Controller		BRC4C82			
Motors	Fan Motor	M1F	1ϕ160W	1ϕ270W	1ϕ430W	
			Thermal protector 275°F : OFF 188.6°F : ON			
	Capacitor for Fan Motor	C1R	6μF 450V	9μF 450V	8μF 450V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-5 ϕ4 L1000 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605A-4 ϕ8 L800 20kΩ (77°F)			
	Thermistor (Heat Exchanger)	R2T	ST8602A-4 ϕ6 L800 20kΩ (77°F)			
Others	Float switch	S1L	FS-0211			
	Fuse	F1U	250V 5A ϕ5.2	250V 10A ϕ5.2		
	Transformer	T1R	TR25H25R0			

Parts Name		Symbol	Model			Remark
			FXHQ 12MVJU	FXHQ 24MVJU	FXHQ 36MVJU	
Remote Controller	Wired Remote Controller		BRC1C71			Option
	Wireless Controller		BRC7E83			
Motors	Fan Motor	M1F	1ϕ63W	1ϕ130W		
			Thermal protector 266°F : OFF 176°F : ON			
	Capacitor for Fan Motor	C1R	3.0μF-450V	9.0μF-450V		
	Swing Motor	M1S	MT8-L[3P058751-1] AC200~240V			
Thermistors	Thermistor (Suction Air)	R1T	ST8601A-1 ϕ4 L250 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-6 ϕ8 L = 1250 20kΩ (77°F)		ST8605-6 ϕ8 L = 1250 20kΩ (77°F)	
	Thermistor (Heat Exchanger)	R2T	ST8602A-6 ϕ6 L = 1250 20kΩ (77°F)		ST8602A-6 ϕ6 L = 1250 20kΩ (77°F)	
Others	Fuse	F1U	250V 5A			
	Transformer	T1R	TR25H25R0			

Parts Name		Symbol	Model					Remark
			FXAQ 07MVJU	FXAQ 09MVJU	FXAQ 12MVJU	FXAQ 18MVJU	FXAQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1C71					Option
	Wireless Remote Controller		BRC7E818					Option
Motors	Fan Motor	M1F	1ϕ40W			1ϕ43W		
			Thermal protector 266°F : OFF 176°F : ON					
	Swing Motor	M1S	MP24[3SB40333-1] AC200~240V			MSFBC20C21 [3SB40550-1] AC200~240V		
Thermistors	Thermistor (Suction Air)	R1T	ST8601-2 ϕ4 L400 20kΩ (77°F)					
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-2 ϕ8 L400 20kΩ (77°F)					
	Thermistor (for Heat Exchanger)	R2T	ST8602-2 ϕ6 L400 20kΩ (77°F)					
Others	Float Switch	S1L	OPTION					
	Fuse	F1U	250V 3.15A					

Parts Name		Symbol	Model			Remark
			FXLQ 12MVJU	FXLQ 18MVJU	FXLQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1C71			Option
	Wireless Remote Controller		—			
Motors	Fan Motor	M1F	1ϕ25W	1ϕ35W		
			Thermal protector 275°F : OFF 248°F : ON			
	Capacitor for Fan Motor	C1R	0.5μF-450V	1.5μF-450V	2.0μF-450V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601-6 ϕ4 L1250 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-9 ϕ8 L2500 20kΩ (77°F)			
	Thermistor (for Heat Exchanger)	R2T	ST8602A-9 ϕ6 L2500 20kΩ (77°F)			
Others	Fuse	F1U	AC250V 5A			
	Transformer	T1R	TR25H25R0			

Parts Name		Symbol	Model			Remark
			FXNQ 12MVJU	FXNQ 18MVJU	FXNQ 24MVJU	
Remote Controller	Wired Remote Controller		BRC1C71			Option
	Wireless Remote Controller		—			
Motors	Fan Motor	M1F	1ϕ25W	1ϕ35W		
			Thermal protector 275°F : OFF 248°F : ON			
	Capacitor for Fan Motor	C1R	0.5μF-450V	1.5μF-450V	2.0μF-450V	
Thermistors	Thermistor (Suction Air)	R1T	ST8601-6 ϕ4 L1250 20kΩ (77°F)			
	Thermistor (for Heat Exchanger High Temp.)	R3T	ST8605-9 ϕ8 L2500 20kΩ (77°F)			
	Thermistor (for Heat Exchanger)	R2T	ST8602A-9 ϕ6 L2500 20kΩ (77°F)			
Others	Fuse	F1U	AC250V 5A			
	Transformer	T1R	TR25H25R0			

4. Option List

4.1 Optional Accessories

Outside Unit

Optional accessories \ Models		RWEYQ60MTJU RWEYQ72MTJU RWEYQ84MTJU	RWEYQ144MTJU RWEYQ168MTJU	RWEYQ216MTJU RWEYQ252MTJU
COOL/HEAT Selector		KRC19-26A		
Fixing box		KJB111A		
Distributive piping	Refnet header	KHRP25M33H (Max. 8 branch) KHRP26M22H, KHRP26M33H (Max. 4 branch) (Max. 8 branch)	KHRP25M33H, KHRP25M72H (Max. 8 branch) (Max. 8 branch) KHRP26M22H, KHRP26M33H, KHRP26M72H (Max. 4 branch) (Max. 8 branch) (Max. 8 branch)	KHRP25M33H, KHRP25M72H, KHRP25M73HU (Max. 8 branch) (Max. 8 branch) (Max. 8 branch) KHRP26M22H, KHRP26M33H, KHRP26M72H, KHRP26M73HU (Max. 4 branch) (Max. 8 branch) (Max. 8 branch) (Max. 8 branch)
	Refnet joint	KHRP25M22T, KHRP25M33T KHRP26M22T, KHRP26M33T	KHRP25M22T, KHRP25M33T, KHRP25M72TU KHRP26M22T, KHRP26M33T, KHRP26M72TU	KHRP25M22T, KHRP25M33T, KHRP25M72TU, KHRP25M73TU KHRP26M22T, KHRP26M33T, KHRP26M72TU, KHRP26M73TU
	Outside unit multi connection piping kit	———	BHFP22MA56U, BHFP26MA56U	BHFP22MA84U, BHFP26MA84U
External control adaptor for outdoor unit		DTA104A62		

NOTE) 1. Refer to the latest drawing.
2. In the case of heat recovery system, COOL/HEAT Selector cannot be connected.

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Optional Accessories of Operation Control System

No.	Item	Type	FXFQ~MVJU	FXSQ~MVJU	FXMQ~MVJU	FXAQ~MVJU	FXLQ~MVJU FXNQ~MVJU	FXHQ~MVJU	FXDQ~MVJU
1	Remote controller	Wireless	BRC7C812	BRC4C82		BRC7E818	—	BRC7E83	BRC4C82
		Wired	BRC1C71						
			BRC1D71						
2	Set back time clock		BRC15A71						
3	Remote sensor		KRCS01-1						
4	Installation box for adaptor PCB		KRP1B98	—				KRP1C93	KRP1B101
5	Central remote controller		DCS302C71						
5-1	Electrical box		KJB311A						
6	Unified on/off controller		DCS301C71						
6-1	Electrical box		KJB212A						
7	Schedule timer		DST301B61						
8	External control adaptor for outdoor unit		★DTA104A62	DTA104A61		—	DTA104A61	★DTA104A62	★DTA104A53
9	D3-NET Expander adaptor		DTA109A51						
10	Simplified remote controller		—	BRC2A71		—	BRC2A71	—	BRC2A71
11	Adaptor for wiring		★KRP1B72	KRP1B71				★KRP1B73	—
12	Wiring adaptor for electrical appendices (2)		★KRP4A73	KRP4A71				★KRP4A72	★KRP4A74

C:3D043022D

Notes:

1.Installation box (No.4) is necessary for each adaptor marked ★.
2.Electrical box (5-1/6-1) is required for controller (No. 5/6).

Building management system

	Part name			Model No.	Function
intelligent Touch Controller	basic	Hardware	intelligent Touch Controller	DCS601C71	• Air-Conditioning management system that can be controlled by a compact all-in-one unit.
	Option	Software	Web	DCS004A71	• Monitors and controls the air conditioning system using the Internet and Web browser application on a PC.
Communication Line	∗2 Interface for use in BACnet®			DMS502A71	Interface unit to allow communications between VRV and BMS. Operation and monitoring of air-conditioning systems through BACnet® communications.
	Optional DIII board			DAM411A1	Expansion kit, installed on DMS502A71, to provide 3 more DIII-NET communication ports. Not usable independently.
	Optional Di board			DAM412A1	Expansion kit, installed on DMS502A71, to provide 16 more wattmeter pulse input points. Not usable independently.
	∗3 Interface for use in LONWORKS®			DMS504B71	Interface unit to allow communications between VRV and BMS. Operation and monitoring of air-conditioning systems through LONWORKS® communication.
Contact/Analog signal	Unification adaptor for computerized control			DCS302A72	Interface between the central monitoring board and central control units
	Wiring adaptor for electrical appendices (2)			KRP4A71-74	To control the group of indoor units collectively, which are connected by the transmission wiring of remote controller.
	External control adaptor for outdoor unit (Must be installed on indoor units.)			DTA104A53, 61, 62	Cooling/Heating mode change over. Demand control and Low noise control are available between the plural outdoor units.

Note:

★1.BACnet® is a registered trademark of American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).
★2.LONWORKS® is a registered trade mark of Echelon Corporation.

5. Thermistor Resistance / Temperature Characteristics

Indoor unit	For air suction	R1T
	For liquid pipe	R2T
	For gas pipe	R3T
Outdoor unit	For outdoor air	R1T
	For coil	R2T
	For suction pipe	R4T
	For Receiver gas pipe	R5T

Outdoor unit fin thermistor R1T

T°F	T°C	kΩ
14	-10	—
18	-8	—
21	-6	88.0
25	-4	79.1
28	-2	71.1
32	0	64.1
35	2	57.8
39	4	52.3
43	6	47.3
46	8	42.9
50	10	38.9
54	12	35.3
57	14	32.1
61	16	29.2
64	18	26.6
68	20	24.3
72	22	22.2
75	24	20.3
79	26	18.5
82	28	17.0
86	30	15.6
90	32	14.2
93	34	13.1
97	36	12.0
100	38	11.1
104	40	10.3
108	42	9.5
111	44	8.8
115	46	8.2
118	48	7.6
122	50	7.0
126	52	6.7
129	54	6.0
133	56	5.5
136	58	5.2
140	60	4.79
144	62	4.46
147	64	4.15
151	66	3.87
154	68	3.61
158	70	3.37
162	72	3.15
165	74	2.94
169	76	2.75
172	78	2.51
176	80	2.41
180	82	2.26
183	84	2.12
187	86	1.99
190	88	1.87
194	90	1.76
198	92	1.65
201	94	1.55
205	96	1.46
208	98	1.38

T°F	T°C	kΩ
-4.0	-20	197.81
-2.2	-19	186.53
-0.4	-18	175.97
1.4	-17	166.07
3.2	-16	156.80
5.0	-15	148.10
6.8	-14	139.94
8.6	-13	132.28
10.4	-12	125.09
12.2	-11	118.34
14.0	-10	111.99
15.8	-9	106.03
17.6	-8	100.41
19.4	-7	95.14
21.2	-6	90.17
23.0	-5	85.49
24.8	-4	81.08
26.6	-3	76.93
28.4	-2	73.01
30.2	-1	69.32
32.0	0	65.84
33.8	1	62.54
35.6	2	59.43
37.4	3	56.49
39.2	4	53.71
41.0	5	51.09
42.8	6	48.61
44.6	7	46.26
46.4	8	44.05
48.2	9	41.95
50.0	10	39.96
51.8	11	38.08
53.6	12	36.30
55.4	13	34.62
57.2	14	33.02
59.0	15	31.50
60.8	16	30.06
62.6	17	28.70
64.4	18	27.41
66.2	19	26.18
68.0	20	25.01
69.8	21	23.91
71.6	22	22.85
73.4	23	21.85
75.2	24	20.90
77.0	25	20.00
78.8	26	19.14
80.6	27	18.32
82.4	28	17.54
84.2	29	16.80
86.0	30	16.10

T°F	T°C	kΩ
86.0	30	16.10
87.8	31	15.43
89.6	32	14.79
91.4	33	14.18
93.2	34	13.59
95.0	35	13.04
96.8	36	12.51
98.6	37	12.01
100.4	38	11.52
102.2	39	11.06
104.0	40	10.63
105.8	41	10.21
107.6	42	9.81
109.4	43	9.42
111.2	44	9.06
113.0	45	8.71
114.8	46	8.37
116.6	47	8.05
118.4	48	7.75
120.2	49	7.46
122.0	50	7.18
123.8	51	6.91
125.6	52	6.65
127.4	53	6.41
129.2	54	6.65
131.0	55	6.41
132.8	56	6.18
134.6	57	5.95
136.4	58	5.74
138.2	59	5.14
140.0	60	4.96
141.8	61	4.79
143.6	62	4.62
145.4	63	4.46
147.2	64	4.30
149.0	65	4.16
150.8	66	4.01
152.6	67	3.88
154.4	68	3.75
156.2	69	3.62
158.0	70	3.50
159.8	71	3.38
161.6	72	3.27
163.4	73	3.16
165.2	74	3.06
167.0	75	2.96
168.8	76	2.86
170.6	77	2.77
172.4	78	2.68
174.2	79	2.60
176.0	80	2.51

Outdoor Unit Thermistors for Discharge Pipe (R31T, 32T)

T°F	T°C	kΩ
32.0	0	640.44
33.8	1	609.31
35.6	2	579.96
37.4	3	552.00
39.2	4	525.63
41.0	5	500.66
42.8	6	477.01
44.6	7	454.60
46.4	8	433.37
48.2	9	413.24
50.0	10	394.16
51.8	11	376.05
53.6	12	358.88
55.4	13	342.58
57.2	14	327.10
59.0	15	312.41
60.8	16	298.45
62.6	17	285.18
64.4	18	272.58
66.2	19	260.60
68.0	20	249.00
69.8	21	238.36
71.6	22	228.05
73.4	23	218.24
75.2	24	208.90
77.0	25	200.00
78.8	26	191.53
80.6	27	183.46
82.4	28	175.77
84.2	29	168.44
86.0	30	161.45
86.0	31	154.79
87.8	32	148.43
89.6	33	142.37
91.4	34	136.59
93.2	35	131.06
95.0	36	125.79
96.8	37	120.76
98.6	38	115.95
100.4	39	111.35
102.2	40	106.96
104.0	41	102.76
105.8	42	98.75
107.6	43	94.92
109.4	44	91.25
111.2	45	87.74
113.0	46	84.38
114.8	47	81.16
116.6	48	78.09
118.4	49	75.14
120.2	50	72.32

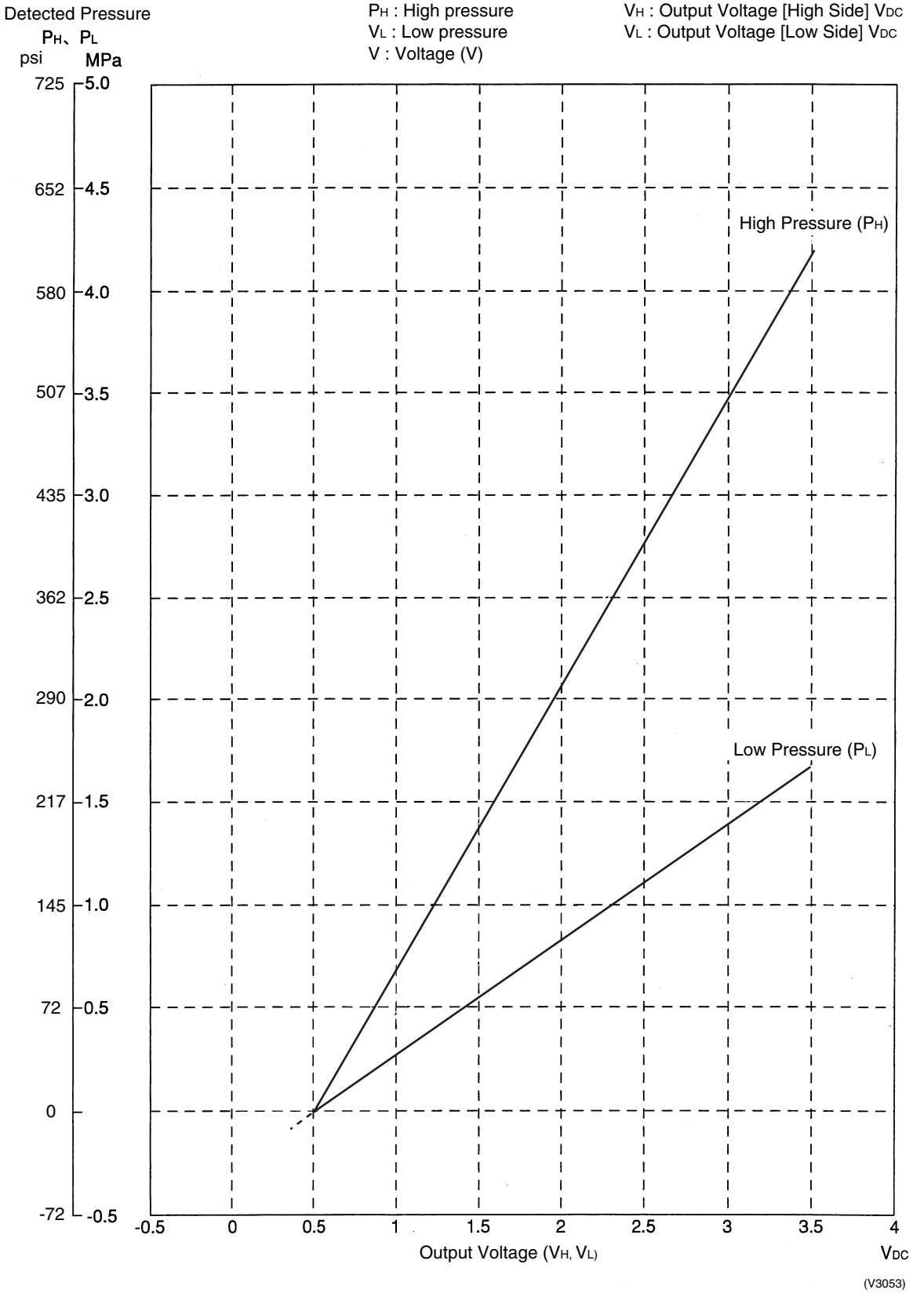
T°F	T°C	kΩ
122.0	50	72.32
123.8	51	69.64
125.6	52	67.06
127.4	53	64.60
129.2	54	62.24
131.0	55	59.97
132.8	56	57.80
134.6	57	55.72
136.4	58	53.72
138.2	59	51.98
140.0	60	49.96
141.8	61	48.19
143.6	62	46.49
145.4	63	44.86
147.2	64	43.30
149.0	65	41.79
150.8	66	40.35
152.6	67	38.96
154.4	68	37.63
156.2	69	36.34
158.0	70	35.11
159.8	71	33.92
161.6	72	32.78
163.4	73	31.69
165.2	74	30.63
167.0	75	29.61
168.8	76	28.64
170.6	77	27.69
172.4	78	26.79
174.2	79	25.91
176.0	80	25.07
177.8	81	24.26
179.6	82	23.48
181.4	83	22.73
183.2	84	22.01
185.0	85	21.31
186.8	86	20.63
188.6	87	19.98
190.4	88	19.36
192.2	89	18.75
194.0	90	18.17
195.8	91	17.61
197.6	92	17.07
199.4	93	16.54
201.2	94	16.04
203.0	95	15.55
204.8	96	15.08
206.6	97	14.62
208.4	98	14.18
210.2	99	13.76
212.0	100	13.35

T°F	T°C	kΩ
212.0	100	13.35
213.8	101	12.95
215.6	102	12.57
217.4	103	12.20
219.2	104	11.84
221.0	105	11.49
222.8	106	11.15
224.6	107	10.83
226.4	108	10.52
228.2	109	10.21
230.0	110	9.92
231.8	111	9.64
233.6	112	9.36
235.4	113	9.10
237.2	114	8.84
239.0	115	8.59
240.8	116	8.35
242.6	117	8.12
244.4	118	7.89
246.2	119	7.68
248.0	120	7.47
249.8	121	7.26
251.6	122	7.06
253.4	123	6.87
255.2	124	6.69
257.0	125	6.51
258.8	126	6.33
260.6	127	6.16
262.4	128	6.00
264.2	129	5.84
266.0	130	5.69
267.8	131	5.54
269.6	132	5.39
271.4	133	5.25
273.2	134	5.12
275.0	135	4.98
276.8	136	4.86
278.6	137	4.73
280.4	138	4.61
282.2	139	4.49
284.0	140	4.38
285.8	141	4.27
287.6	142	4.16
289.4	143	4.06
291.2	144	3.96
293.0	145	3.86
294.8	146	3.76
296.6	147	3.67
298.4	148	3.58
300.2	149	3.49
302.0	150	3.41

6. Pressure Sensor

P_H = 1.38V-0.69
P_L = 0.57V-0.28
P_H : High pressure
V_L : Low pressure
V : Voltage (V)

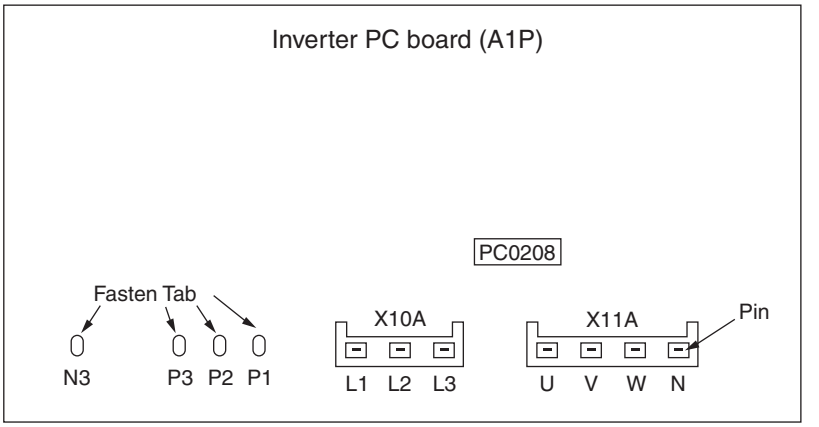
P_H : Detected Pressure [High Side]
P_L : Detected Pressure [Low Side]
V_H : Output Voltage [High Side] V_{DC}
V_L : Output Voltage [Low Side] V_{DC}



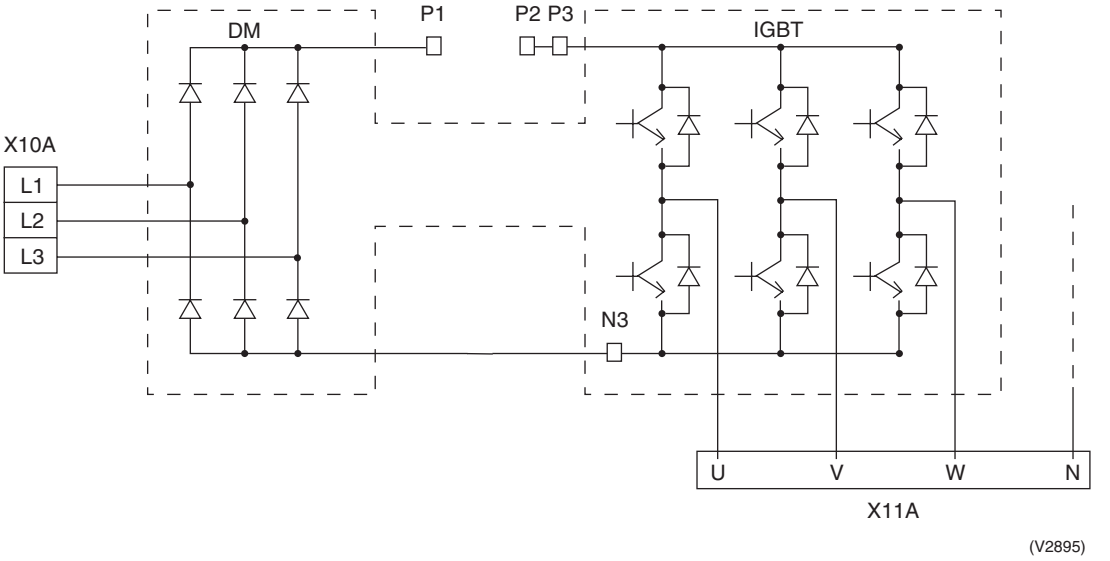
7. Method of Replacing the Inverter's Power Transistors and Diode Modules

7.1 Method of Replacing the Inverter's Power Transistors and Diode Modules

Inverter P.C.Board



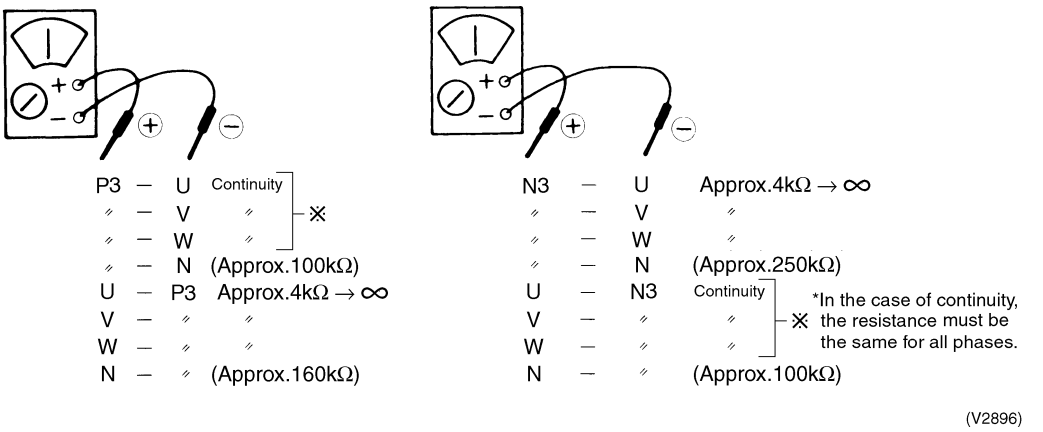
Electronic circuit



[Decision according to continuity check by analog tester]

- Before checking, disconnect the electric wiring connected to the power transistor and diode module.

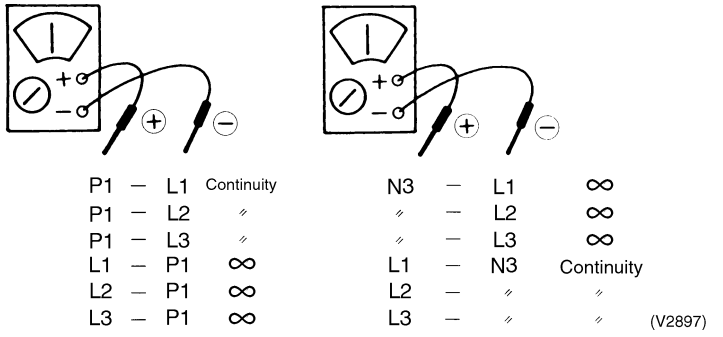
Power Transistor IGBT (On Inverter PC Board)



(Decision)
If other than given above, the power unit is defective and must be replaced.

Note: If using a digital tester, ∞ and continuity may be reversed.

Diode Module



(Decision)
If other than given above, the diode module is defective and must be replaced.

Note: If using a digital tester, ∞ and continuity may be reversed.

Part 9
Precautions for New Refrigerant (R-410A)

1. Precautions for New Refrigerant (R-410A) 284
   1.1 Outline 284
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1. Precautions for New Refrigerant (R-410A)

1.1 Outline

1.1.1 About Refrigerant R-410A

■ Characteristics of new refrigerant, R-410A

1. Performance
   Almost the same performance as R-22 and R-407C
2. Pressure
   Working pressure is approx. 1.4 times more than R-22 and R-407C.
3. Refrigerant composition
   Few problems in composition control, since it is a Quasi-azeotropic mixture refrigerant.

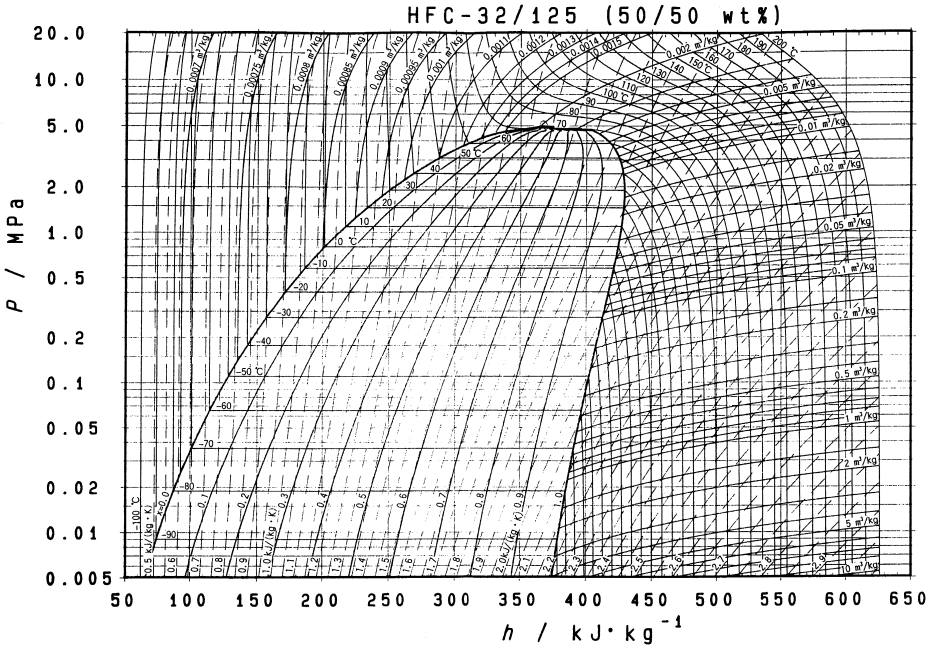
	HFC units (Units using new refrigerants)		HCFC units
Refrigerant name	R-407C	R-410A	R-22
Composing substances	Non-azeotropic mixture of HFC32, HFC125 and HFC134a (*1)	Quasi-azeotropic mixture of HFC32 and JFC125 (*1)	Single-component refrigerant
Design pressure	3.2 MPa (gauge pressure) = 32.6 kgf/cm^2 = 464 psi	4.0 MPa (gauge pressure) = 40.8 kgf/cm^2 = 580 psi	2.75MPa (gauge pressure) = 28.0 kgf/cm^2 = 399 psi
Refrigerant oil	Synthetic oil (Ether)		Mineral oil (Suniso)
Ozone destruction factor (ODP)	0	0	0.05
Combustibility	None	None	None
Toxicity	None	None	None

★1. Non-azeotropic mixture refrigerant: mixture of two or more refrigerants having different boiling points.

★2. Quasi-azeotropic mixture refrigerant: mixture of two or more refrigerants having similar boiling points.

★3. The design pressure is different at each product. Please refer to the installation manual for each product.

(Reference) 1 MPa≒ 10.19716 kgf / cm^2
1 MPa≒ 145 psi



Pressure-Enthalpy curves of HFC-32/125 (50/50wt%)

■ Thermodynamic characteristic of R-410A

DAIREP ver2.0

Temperature (°C)	Steam pressure (kPa)		Density (kg/m³)		Specific heat at constant pressure (kJ/kgK)		Specific enthalpy (kJ/kg)		Specific entropy (kJ/KgK)	
	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor
-70	36.13	36.11	1410.7	1.582	1.372	0.695	100.8	390.6	0.649	2.074
-68	40.83	40.80	1404.7	1.774	1.374	0.700	103.6	391.8	0.663	2.066
-66	46.02	45.98	1398.6	1.984	1.375	0.705	106.3	393.0	0.676	2.058
-64	51.73	51.68	1392.5	2.213	1.377	0.710	109.1	394.1	0.689	2.051
-62	58.00	57.94	1386.4	2.463	1.378	0.715	111.9	395.3	0.702	2.044
-60	64.87	64.80	1380.2	2.734	1.379	0.720	114.6	396.4	0.715	2.037
-58	72.38	72.29	1374.0	3.030	1.380	0.726	117.4	397.6	0.728	2.030
-56	80.57	80.46	1367.8	3.350	1.382	0.732	120.1	398.7	0.741	2.023
-54	89.49	89.36	1361.6	3.696	1.384	0.737	122.9	399.8	0.754	2.017
-52	99.18	99.03	1355.3	4.071	1.386	0.744	125.7	400.9	0.766	2.010
-51.58	101.32	101.17	1354.0	4.153	1.386	0.745	126.3	401.1	0.769	2.009
-50	109.69	109.51	1349.0	4.474	1.388	0.750	128.5	402.0	0.779	2.004
-48	121.07	120.85	1342.7	4.909	1.391	0.756	131.2	403.1	0.791	1.998
-46	133.36	133.11	1336.3	5.377	1.394	0.763	134.0	404.1	0.803	1.992
-44	146.61	146.32	1330.0	5.880	1.397	0.770	136.8	405.2	0.816	1.987
-42	160.89	160.55	1323.5	6.419	1.401	0.777	139.6	406.2	0.828	1.981
-40	176.24	175.85	1317.0	6.996	1.405	0.785	142.4	407.3	0.840	1.976
-38	192.71	192.27	1310.5	7.614	1.409	0.792	145.3	408.3	0.852	1.970
-36	210.37	209.86	1304.0	8.275	1.414	0.800	148.1	409.3	0.864	1.965
-34	229.26	228.69	1297.3	8.980	1.419	0.809	150.9	410.2	0.875	1.960
-32	249.46	248.81	1290.6	9.732	1.424	0.817	153.8	411.2	0.887	1.955
-30	271.01	270.28	1283.9	10.53	1.430	0.826	156.6	412.1	0.899	1.950
-28	293.99	293.16	1277.1	11.39	1.436	0.835	159.5	413.1	0.911	1.946
-26	318.44	317.52	1270.2	12.29	1.442	0.844	162.4	414.0	0.922	1.941
-24	344.44	343.41	1263.3	13.26	1.448	0.854	165.3	414.9	0.934	1.936
-22	372.05	370.90	1256.3	14.28	1.455	0.864	168.2	415.7	0.945	1.932
-20	401.34	400.06	1249.2	15.37	1.461	0.875	171.1	416.6	0.957	1.927
-18	432.36	430.95	1242.0	16.52	1.468	0.886	174.1	417.4	0.968	1.923
-16	465.20	463.64	1234.8	17.74	1.476	0.897	177.0	418.2	0.980	1.919
-14	499.91	498.20	1227.5	19.04	1.483	0.909	180.0	419.0	0.991	1.914
-12	536.58	534.69	1220.0	20.41	1.491	0.921	182.9	419.8	1.003	1.910
-10	575.26	573.20	1212.5	21.86	1.499	0.933	185.9	420.5	1.014	1.906
-8	616.03	613.78	1204.9	23.39	1.507	0.947	189.0	421.2	1.025	1.902
-6	658.97	656.52	1197.2	25.01	1.516	0.960	192.0	421.9	1.036	1.898
-4	704.15	701.49	1189.4	26.72	1.524	0.975	195.0	422.6	1.048	1.894
-2	751.64	748.76	1181.4	28.53	1.533	0.990	198.1	423.2	1.059	1.890
0	801.52	798.41	1173.4	30.44	1.543	1.005	201.2	423.8	1.070	1.886
2	853.87	850.52	1165.3	32.46	1.552	1.022	204.3	424.4	1.081	1.882
4	908.77	905.16	1157.0	34.59	1.563	1.039	207.4	424.9	1.092	1.878
6	966.29	962.42	1148.6	36.83	1.573	1.057	210.5	425.5	1.103	1.874
8	1026.5	1022.4	1140.0	39.21	1.584	1.076	213.7	425.9	1.114	1.870
10	1089.5	1085.1	1131.3	41.71	1.596	1.096	216.8	426.4	1.125	1.866
12	1155.4	1150.7	1122.5	44.35	1.608	1.117	220.0	426.8	1.136	1.862
14	1224.3	1219.2	1113.5	47.14	1.621	1.139	223.2	427.2	1.147	1.859
16	1296.2	1290.8	1104.4	50.09	1.635	1.163	226.5	427.5	1.158	1.855
18	1371.2	1365.5	1095.1	53.20	1.650	1.188	229.7	427.8	1.169	1.851
20	1449.4	1443.4	1085.6	56.48	1.666	1.215	233.0	428.1	1.180	1.847
22	1530.9	1524.6	1075.9	59.96	1.683	1.243	236.4	428.3	1.191	1.843
24	1615.8	1609.2	1066.0	63.63	1.701	1.273	239.7	428.4	1.202	1.839
26	1704.2	1697.2	1055.9	67.51	1.721	1.306	243.1	428.6	1.214	1.834
28	1796.2	1788.9	1045.5	71.62	1.743	1.341	246.5	428.6	1.225	1.830
30	1891.9	1884.2	1034.9	75.97	1.767	1.379	249.9	428.6	1.236	1.826
32	1991.3	1983.2	1024.1	80.58	1.793	1.420	253.4	428.6	1.247	1.822
34	2094.5	2086.2	1012.9	85.48	1.822	1.465	256.9	428.4	1.258	1.817
36	2201.7	2193.1	1001.4	90.68	1.855	1.514	260.5	428.3	1.269	1.813
38	2313.0	2304.0	989.5	96.22	1.891	1.569	264.1	428.0	1.281	1.808
40	2428.4	2419.2	977.3	102.1	1.932	1.629	267.8	427.7	1.292	1.803
42	2548.1	2538.6	964.6	108.4	1.979	1.696	271.5	427.2	1.303	1.798
44	2672.2	2662.4	951.4	115.2	2.033	1.771	275.3	426.7	1.315	1.793
46	2800.7	2790.7	937.7	122.4	2.095	1.857	279.2	426.1	1.327	1.788
48	2933.7	2923.6	923.3	130.2	2.168	1.955	283.2	425.4	1.339	1.782
50	3071.5	3061.2	908.2	138.6	2.256	2.069	287.3	424.5	1.351	1.776
52	3214.0	3203.6	892.2	147.7	2.362	2.203	291.5	423.5	1.363	1.770
54	3361.4	3351.0	875.1	157.6	2.493	2.363	295.8	422.4	1.376	1.764
56	3513.8	3503.5	856.8	168.4	2.661	2.557	300.3	421.0	1.389	1.757
58	3671.3	3661.2	836.9	180.4	2.883	2.799	305.0	419.4	1.403	1.749
60	3834.1	3824.2	814.9	193.7	3.191	3.106	310.0	417.6	1.417	1.741
62	4002.1	3992.7	790.1	208.6	3.650	3.511	315.3	415.5	1.433	1.732
64	4175.7	4166.8	761.0	225.6	4.415	4.064	321.2	413.0	1.450	1.722

1.2 Service Tools

R-410A is used under higher working pressure, compared to previous refrigerants (R-22, R-407C). Furthermore, the refrigerating machine oil has been changed from Suniso oil to Ether oil, and if oil mixing is occurred, sludge results in the refrigerants and causes other problems. Therefore, gauge manifolds and charge hoses that are used with a previous refrigerant (R-22, R-407C) can not be used for products that use new refrigerants.
Be sure to use dedicated tools and devices.

■ Tool compatibility

Tool	Compatibility			Reasons for change
	HFC		HCFC	
	R-410A	R-407C	R-22	
Gauge manifold Charge hose	×			• Do not use the same tools for R-22 and R-410A. • Thread specification differs for R-410A and R-407C.
Gas detector	○		×	• The same tool can be used for HFCs.
Vacuum pump (pump with reverse flow preventive function)	○			• To use existing pump for HFCs, vacuum pump adaptor must be installed.
Weighting instrument	○			
Flaring tool (Clutch type)	○			• For R-410A, flare gauge is necessary.
Torque wrench	○			• Torque-up for 1/2 and 5/8
Pipe cutter	○			
Pipe expander	○			
Pipe bender	○			
Pipe assembling oil	×			• Due to refrigerating machine oil change. (No Suniso oil can be used.)
Refrigerant recovery device	Check your recovery device.			
Refrigerant piping	See the chart below.			• Only ϕ19.1 is changed to 1/2H material while the previous material is “O”.

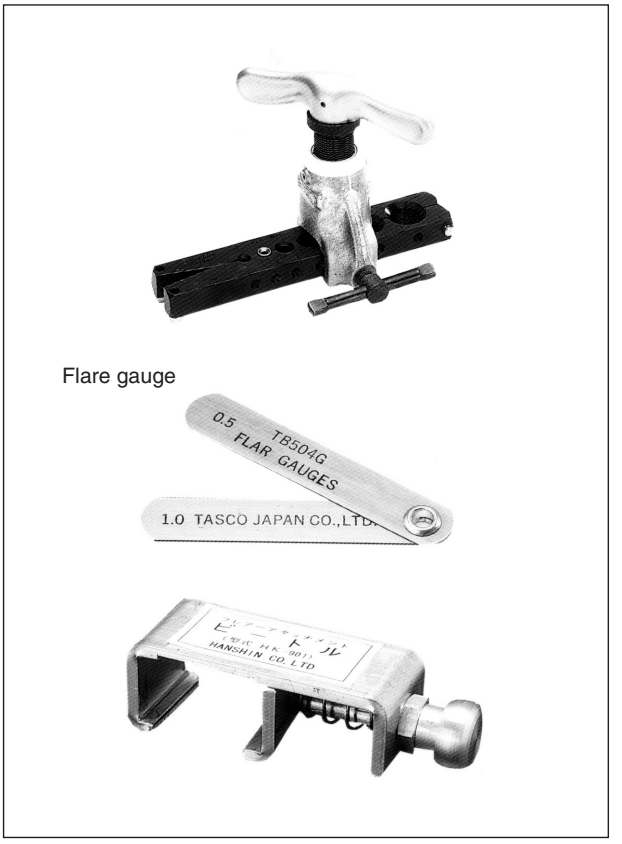
As for the charge mouthpiece and packing, 1/2UNF20 is necessary for mouthpiece size of charge hose.

■ Copper tube material and thickness

Pipe size	R-407C		R-410A	
	Material	Thickness [mm]	Material	Thickness [mm]
ϕ6.4	O	0.8	O	0.8
ϕ9.5	O	0.8	O	0.8
ϕ12.7	O	0.8	O	0.8
ϕ15.9	O	1.0	O	1.0
ϕ19.1	O	1.0	1/2H	1.0
ϕ22.2	1/2H	1.0	1/2H	1.0
ϕ25.4	1/2H	1.0	1/2H	1.0
ϕ28.6	1/2H	1.0	1/2H	1.0
ϕ31.8	1/2H	1.2	1/2H	1.1
ϕ38.1	1/2H	1.4	1/2H	1.4
ϕ44.5	1/2H	1.6	1/2H	1.6

* O: Soft (Annealed)
H: Hard (Drawn)

1. Flaring tool



■ Specifications

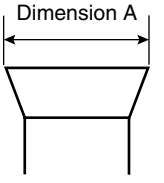
• Dimension A

Unit:mm

Nominal size	Tube O.D.	$A^{+0}_{-0.4}$	
	Do	Class-2 (R-410A)	Class-1 (Conventional)
1/4	6.35	9.1	9.0
3/8	9.52	13.2	13.0
1/2	12.70	16.6	16.2
5/8	15.88	19.7	19.4
3/4	19.05	24.0	23.3

■ Differences

• Change of dimension A



For class-1: R-407C
For class-2: R-410A

Conventional flaring tools can be used when the work process is changed.
(change of work process)
Previously, a pipe extension margin of 0 to 0.5mm was provided for flaring. For R-410A air conditioners, perform pipe flaring with a pipe extension margin of 1.0 to 1.5mm.
(For clutch type only)
Conventional tool with pipe extension margin adjustment can be used.

2. Torque wrench

■ Specifications

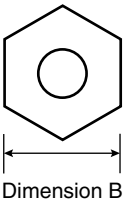
• Dimension B Unit:mm

Nominal size	Class-1	Class-2	Previous
1/2	24	26	24
5/8	27	29	27

No change in tightening torque
No change in pipes of other sizes

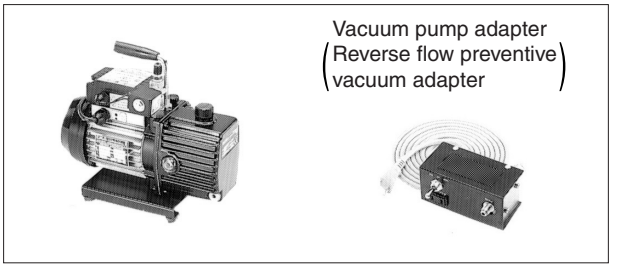
■ Differences

• Change of dimension B
Only 1/2", 5/8" are extended



For class-1: R-407C
For class-2: R-410A

3. Vacuum pump with check valve



■ Specifications

• Discharge speed
50 l/min (50Hz)
60 l/min (60Hz)
• Suction port UNF7/16-20 (1/4 Flare)
UNF1/2-20 (5/16 Flare) with adapter

● Maximum degree of vacuum
Select a vacuum pump which is able to keep the vacuum degree of the system in excess of –14.6 psi (5 torr or 5000 micron or – 755 mmHg).

■ Differences

• Equipped with function to prevent reverse oil flow
• Previous vacuum pump can be used by installing adapter.

4. Leak tester

■ Specifications
- Hydrogen detecting type, etc.
- Applicable refrigerants
  R-410A, R-407C, R-404A, R-507A, R-134a, etc.

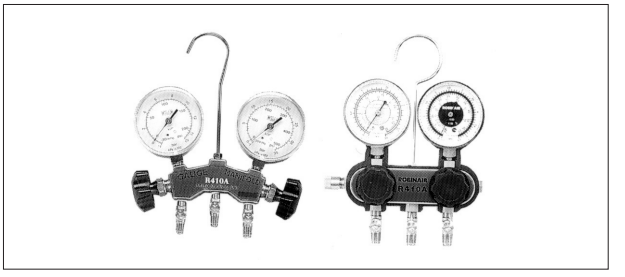
■ Differences
- Previous testers detected chlorine. Since HFCs do not contain chlorine, new tester detects hydrogen.

5. Refrigerant oil

■ Specifications
- Contains synthetic oil, therefore it can be used for piping work of every refrigerant cycle.
- Offers high rust resistance and stability over long period of time.

■ Differences
- Can be used for R-410A and R-22 units.

6. Gauge manifold for R-410A

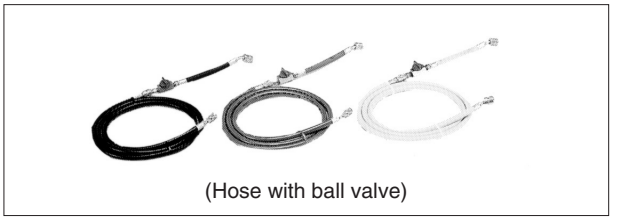


■ Specifications
- High pressure gauge
  15 to 770 psi (-76 cmHg to 53 kg/cm^2)
- Low pressure gauge
  15 to 550 psi (-76 cmHg to 38 kg/cm^2)

- 1/4" → 5/16" (2min → 2.5min)
- No oil is used in pressure test of gauges.
  → For prevention of contamination
- Temperature scale indicates the relationship between pressure and temperature in gas saturated state.

■ Differences
- Change in pressure
- Change in service port diameter

7. Charge hose for R-410A



(Hose with ball valve)

■ Specifications
- Working pressure 737 psi (51.8 kg/cm^2)
- Rupture pressure 3685 psi (259 kg/cm^2)
- Available with and without hand-operate valve that prevents refrigerant from outflow.

■ Differences
- Pressure proof hose
- Change in service port diameter
- Use of nylon coated material for HFC resistance

8. Weigher for refrigerant charge

■ Specifications
- High accuracy
  TA101A (for 10-kg cylinder) = ± 2g
  TA101B (for 20-kg cylinder) = ± 5g
- Equipped with pressure-resistant sight glass to check liquid refrigerant charging.
- A manifold with separate ports for HFCs and previous refrigerants is equipped as standard accessories.

■ Differences
- Measurement is based on weight to prevent change of mixing ratio during charging.

Regarding purchasing of service tools, please contact following address.
Daikin U. S. Corporation (Dallas Office)
1645 Wallace Dr, Ste 110 Carrollton, TX 75006
“Tel : 1-972-245-1510 Fax : 1-972-245-1038”

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About ISO 9001

ISO 9001 is a plant certification system defined by the International Organization for Standardization (ISO) relating to quality assurance. ISO 9001 certification covers quality assurance aspects related to the "design, development, manufacture, installation, and supplementary service" of products manufactured at the plant.

EC99J2044

About ISO 14001

ISO 14001 is the standard defined by the International Organization for Standardization (ISO) relating to environmental management systems. Our group has been acknowledged by an internationally accredited compliance organisation as having an appropriate programme of environmental protection procedures and activities to meet the requirements of ISO 14001.

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